

## COURSE PLAN

### FIRST: BASIC INFORMATION

<b>College</b>					
<b>College</b>	: Faculty of Engineering Technology				
<b>Department</b>	: <b>Mechanical Engineering</b>				
<b>Course</b>					
<b>Course Title</b>	: Basics of Electricity and Electronics Laboratory				
<b>Course Code</b>	: <b>020300102</b>				
<b>Credit Hours</b>	: 1 (0 Theoretical, 1 Practical)				
<b>Prerequisite</b>	*020300101				
<b>Instructor</b>					
<b>Name</b>	: Dr.				
<b>Office No.</b>	:				
<b>Tel (Ext)</b>	:				
<b>E-mail</b>	:				
<b>Office Hours</b>	:				
<b>Class Times</b>	Building	Day	Start Time	End Time	Room No.
	00	00	00	00	00
<b>Text Book</b>					
<b>Title</b>	: - Electricity and Electronics Fundamentals, Second Edition, Dale R. Patrick, Stephen W. Fardo.				

<b>References</b>					
1. Basic Electricity 2nd Edition.pdf Charles W Ryan.					

### SECOND: PROFESSIONAL INFORMATION

<b>COURSE DESCRIPTION</b>					
<p>This course covers the knowledge of practical basic principles of electric and electronic equipment in automobiles. It includes practical concepts of DC/AC circuits, current and voltage measurement, a simple electronic circuit, DC /AC machines, single-phase transformer and protection devices and circuits.</p>					

<b>COURSE OBJECTIVES</b>					
<p><b>The objective of this course is to enable the student to do the following:</b></p> <ul style="list-style-type: none"> <li>- Develop a working competence of using electric and electronic equipment.</li> <li>- Develop a working competence of using AC and DC circuits and Current and voltage measurements.</li> <li>- Develop a working competence of using electrical machines.</li> <li>- Explain and distinguish different types of control elements and protection devices.</li> </ul>					

### COURSE LEARNING OUTCOMES

By the end of the course, the students will be able to:

- CLO1. Apply basic safety requirements at workshops
- CLO2. Build a series and parallel DC circuits
- CLO3. Perform the basic process of power measurements in DC
- CLO4. Construct basic AC circuits
- CLO5. Explain the basics of single-phase transformer
- CLO6. Diagnose and repair electrical machines
- CLO7. Diagnose and repair semiconductor devices
- CLO8. Diagnose and repair control and protection devices

### COURSE SYLLABUS

Week	Topic	Topic Details	Reference (Chapter)	Proposed Assignments
1	Personal and Tools Safety	<ul style="list-style-type: none"> <li>• Personal safety.</li> <li>• Tool's safety.</li> <li>• Special tools.</li> <li>• Electricity and Electronics basics.</li> </ul>	CLO1	
2	Series and parallel DC circuits-1	<ul style="list-style-type: none"> <li>• Voltage Devices.</li> <li>• Current devices.</li> </ul>	CLO2	
3	Series and parallel DC circuits-2	<ul style="list-style-type: none"> <li>• Current measurements.</li> <li>• Voltage measurements.</li> </ul>	CLO2	Practice report
4	Power measurements in DC circuits-1	<ul style="list-style-type: none"> <li>• Conservation of energy.</li> </ul>	CLO3	
5	AC circuits-1	<ul style="list-style-type: none"> <li>• Identification of sine waves.</li> </ul>	CLO4	Practice report
6	AC circuits-2	<ul style="list-style-type: none"> <li>• Using oscilloscope to determine and measure the main features of sine waves.</li> </ul>	CLO4	
7	AC circuits-3	<ul style="list-style-type: none"> <li>• Study Resonance for series RLC circuits.</li> </ul>	CLO4	Practice report
8	<b>Mid Exam</b>			
9	Transformer	<ul style="list-style-type: none"> <li>• Study the relationships between primary and secondary windings.</li> </ul>	CLO5	
10	DC Machines-1	<ul style="list-style-type: none"> <li>• DC motors and generators.</li> <li>• Construction and principle of operation <b>OF WHAT</b>.</li> <li>• Main characteristics.</li> </ul>	CLO6	Practice report
11	DC Machines-2	<ul style="list-style-type: none"> <li>• Induction motors: single-phase and three-phase.</li> <li>• Construction and principle of operation <b>OF WHAT</b>.</li> <li>• 3 Phase Induction Motors.</li> </ul>	CLO6	

12	<b>Semiconductor devices-1</b>	• Investigate the characteristics of diodes and transistors.	<b>CLO7</b>	
13	<b>Semiconductor devices-2</b>	• Build simple rectification circuits.	<b>CLO7</b>	<b>Practice report</b>
14	<b>Control and protection devices-1</b>	• Switches, relays, circuit breakers, electromagnetic, thermal and bi-metallic contactors.	<b>CLO8</b>	
15	<b>Control and protection devices-2</b>	• Ratings, applications, symbols, basic principle of operation.	<b>CLO8</b>	<b>Practice report</b>
16	<b>Final Exam</b>			

### COURSE LEARNING RESOURCES

The effectiveness of teaching in this course depends on making students familiar with the basic electrical and electronic systems, such as AC and DC devices, Electrical Machines, semiconductors, and protection devices.

#### Teaching methods:

- Exercising and practicing (conducting experiments): by training students to do all the practical works using the right instruments and measuring devices, and to identify the type of exercise.
- ~~Online research skills, watching related videos such as you tube, on topics related to course objectives and recent developments in the field of specific work.~~
- ~~Learning skills and adaptability: Developed by transferring students and reconfiguring work teams to enable them to adapt to other individuals from time to time.~~

### ONLINE RESOURCES

Basic Electricity 2nd Edition.pdf Charles W Ryan

### ASSESSMANT TOOLS

ASSESSMENT TOOLS	%
Research and Reports	10
Oral Exams	10
Mid Exam	40
Final Exam	40
<b>TOTAL MARKS</b>	<b>100</b>

### THIRD: COURSE RULES

#### ATTENDANCE RULES

Attendance and participation are extremely important, and the usual University rules will apply. Attendance will be recorded for each class. Absence of 10% will result in a first written warning. Absence of 15% of the course will result in a second warning. Absence of 20% or more will result in



forfeiting the course and the student will not be permitted to attend the final examination. Should a student encounter any special circumstances (i.e., medical or personal), he/she is encouraged to discuss this with the instructor and written proof will be required to delete any absences from his/her attendance records.

### GRADING SYSTEM

#### Example:

0 – 49 Fail  
50 – 100 Pass

### REMARKS

{The instructor can add any comments and directives such as the attendance policy and topics related to ethics}

### COURSE COORDINATOR

**Course Coordinator:**  
**Signature:**  
**Date:**

**Department Head:**  
**Signature:**  
**Date:**