



Program Engineering

Specialization	Common
Course Number	20301121
Course Title	Electrical workshops
Credit Hours	2
Theoretical Hours	0
Practical Hours	6



Brief Course Description:

- ❖ Electric wiring for building, such as lighting wiring systems ,alarm systems ,motor control systems ,inspecting maintaining rewinding electrical transformers ,and machines ,Applying safety and security means in electrical works , Electronic circuits building and printed circuits , repair and maintenance techniques.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. To construct Electrical wiring for buildings.
2. To construct Electrical wiring for alarm systems.
3. To construct Electrical wiring for single and three phase motors and control circuits.
4. To construct Electrical wiring for transformers.
5. To construct Electrical wiring for DC motors.
6. Preparing and designing electronic circuits.



Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	Introduction	<ul style="list-style-type: none"> ▪ Tools ,apparatus and equipment presentation ▪ Workshop safety instructions ▪ Types and classification of cables and wires, wires connecting sk 	
2.	Electrical wiring fixtures and accessories	<ul style="list-style-type: none"> ▪ Switches , outlets, junction boxes, lamp accessories and their fixing methods ▪ Underground low voltage raceway cable techniques and practices 	
3.	Electrical wiring circuits	<ul style="list-style-type: none"> ▪ Wiring practices of lighting circuits (single-pole switch, double-way switch, staircase switches florescent lamp assembling) ▪ Single-phase and three-phase outlets wiring and practices, with and without earthing ▪ Telephone, intercom, interphone wiring practices, bell and call system wiring 	
4.	Conduits and trunks for electrical wiring	<ul style="list-style-type: none"> ▪ Conduits classification, conduit bending methods and practices ▪ Trunks and conduits fixing and wiring practices 	

5.	Transformers	<ul style="list-style-type: none"> ▪ Single-phase and three-phase transformers (cored and unvaried), autotransformers and voltage regulators ▪ Current and voltage transformer techniques and maintenance ▪ Rewinding transformers. 	
6.	Single-phase motors	<ul style="list-style-type: none"> ▪ Shaded pole, split, wounded and capacitor motors, universal motor ▪ Motors inspections, repairing and rewinding techniques. 	
7.	Three-phase motors.	<ul style="list-style-type: none"> ▪ Motor construction presentation for wounded motor, squirrel-cage motor and synchronous ▪ Three-phase motor inspection, maintaining and rewinding techniques 	
8.	DC motors	<ul style="list-style-type: none"> ▪ Construction presentation of DC machines (series, shunt and compound machines) ▪ Armature coil rewinding for ring type and waving type windings 	
9.	<ul style="list-style-type: none"> ▪ Installation and wiring of electrical machines circuits 	<ul style="list-style-type: none"> ▪ Installing and protecting techniques of AC/DC electrical machine using : thermal relays, electromagnetic relays, manual switches and double speed switches ▪ Installing techniques of three – phase motors using: star/ delta starting switches, autotransformers, and starting resistances 	

10.	Printed circuits techniques	<ul style="list-style-type: none"> ▪ Hand preparing and designing, computer preparing and designing ▪ Printing the electronic circuit on the tablet and developing it. ▪ Etching and drilling the tablet ▪ Assembling and wilding the tablet 	
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Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	30%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects			
Discussions and lecture Presentations			

Teaching Methodology:

- ❖ Workshops

Textbook & References :

1. Wiring simplified. Based on the 2005 National code. By H.P. Richter 2005.
2. Practical electrical wiring : Residential , Farm , commercial and industrial ,By H. P. Richter and W. Creighton Schwan ,1996.
3. Manuals existing at the laboratory and the laboratory sheets prepared by the instructors

