



Electrical and Computer Engineering Department
Electrical Installations and Drawings
ENEE 4202

Instructor: *Dr. M. Abu-Khaizaran*

First Semester 2020/2021

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Office No.: Masri 216

Prerequisite: Network Analysis I (ENEE 2301) and preferably Circuits Lab (ENEE2101)

ENEE4202	1L ELECTRICAL INSTALLATION AND DRAWING	15	15	W	14:15 - 16:55	Masri206
ENEE4202	1 ELECTRICAL INSTALLATION AND DRAWING	32	45	M	13:00 - 13:50	Masri404
ENEE4202	2L ELECTRICAL INSTALLATION AND DRAWING	15	15	M	14:15 - 16:55	Masri205

Office Hours: To be announced later

Intended Learning Outcomes

	Intended Learning Outcomes (ILO's) of the course	Programme objectives
1	To be familiar with computer soft-wares used in drawing of electrical installations	k
2	To be able to describe and recognize the key operating principles and characteristics of electrical installation elements (conductors, conduits, luminaries, protective devices, earthing systems, lighting systems, extra low voltage systems, power socket system, effect of electric current on a human body, testing equipment)	a
3	To be able to memorize and draw equivalents circuits used in lighting systems, extra low voltage systems, power socket system	a
4	To be able to analyze circuits used in electrical installations (calculation of illumination, coordination, discrimination, diversity factor, or calculation of earthing electrode resistance....)	a
5	To practice installations of various elements of electrical installations in particular lighting and extra low voltage systems including conduits, cables, fuses, circuit breakers, residual current devices and luminaries,...	b
6	To be able to design and draw, using computer software, Extra Low Voltage, Lighting, and Power socket installations according to relevant National codes/standards	k

Teaching Methods:

The course will be delivered on-line via ZOOM, except 5 face-face experiments, as Power Point Presentations, illustration by Smart Board, Interactive discussions, using Drawing software, and practical experimentation (face to face).

Course Contents:

a) Topics covered in lectures:

1. Introduction to Single and three phase installations **(1 Lecture)**
2. Panel boards, Main Distribution Boards and Installation Elements **(1 Lecture)**
3. Electrical Plans and Drawings; Installations symbols, Lighting plans, Lighting circuits, Power Plans, Extra Low Voltage Plans and Basic Considerations **(2 Lectures)**
4. Extra Low voltage Systems: Telephone System, TV Systems, Data Systems, Fire Alarm System, Security Alarm Systems, and Call Systems **(2 Lectures)**
5. Illumination and Light sources: characteristics, types, applications and illumination Calculation **(2 Lectures)**
6. Conducting and Insulation Materials; Cables, wires, trunks, conduits, and main insulation materials **(1 Lecture)**
7. Human Body and Earthing Systems: Electric shock, Grounding and Bonding, types and methods of Earthing **(2 Lectures)**
8. Faults, Protection and Protective Devices: Types of faults, Fuses, MCB and RCD, types and characteristics **(2 Lectures)**
9. Electric Circuits Design: Diversity Factor, main consideration, load estimation, design procedure **(1 Lecture)**
10. Inspection, Testing and Measuring Instruments **(2 Lecture)**

b) Topics Covered in Laboratory:

Computer Design Via ZOOM

1. Introduction to AutoCAD (familiarization with AutoCAD features, commands and drawing simple components).
2. Introduction and drawing electrical symbols, and wiring diagrams for lighting systems.
3. Drawing a single-phase domestic electrical installation using AutoCAD –Part I
4. Designing and drawing domestic electrical installation using AutoCAD-Part II
5. Designing a three phase electrical installation for a building, a hall, a hospital, or a factory using AutoCAD
6. Introduction to Three-Dimensional (3D) Drawings

Practical work and Installations

7. Introduction to physical components of electrical installations; wires, cables, breakers, RCD, relays, switches, timers and tools.
8. Installation of distribution boards, kWh meter, Miniature circuit breakers and timers and electric bell
9. Installation of lighting components
10. Installation of power components and socket outlets
11. Installations of extra low voltage components, introduction to three-phase installations, and demonstration about testing and measuring equipment

Exams and Grading:

Mid Term Exams	20%
PreLabs, Lab Activities, Exercises and Assignments	25%
Final Theoretical Exam	25%
Final Drawing and Practical Exams	30%

References:

- ❖ Electrical Installation Work by Brian Scaddan, 5th ed., Newnes, 2005
- ❖ Electrical Wiring Residential by Ray C. Mullin and Phil Simmons, 17th ed., Delmar Cengage Learning, 2011
- ❖ Lighting Design Basics, by Mark Karlen and James Benya, Wiley, 2004.
- ❖ Electrical Wiring Commercial by Ray C. Mullin and Phil Simmons, 14th ed., Delmar Cengage Learning, 2011
- ❖ Electrical Wiring Industrial by Stephen Herman, 14th ed., Delmar Cengage Learning, 2011
- ❖ Electric Wiring Domestic by Brian Scaddan, 12th ed., Newnes, 2003
- ❖ Mechanical and Electrical equipment for Buildings (10th ed.) Stein and Reynolds, Wiley, 2006.
- ❖ Electrical Installations Handbook (3rd Ed.) Seip Siemens, Wiley, 2000.
- ❖ AutoCAD Tutorials, e.g. "<http://www.we-r-here.com/cad/tutorials/index.htm>"
- ❖ Lighting Design Basics by Mark Karlen, 2nd ed., Wiley, 2012