



# Philadelphia University

Faculty of Engineering - Department of Electrical Engineering

First Semester 2022/2023

## Course Details:

<b>Title:</b>	Electric Installation (610419)
<b>Prerequisite:</b>	Power System (1) (610411)
<b>Credit Hours:</b>	3 credit hours (16 weeks per semester, approximately 45 contact hours)
<b>Textbook:</b>	Electrical Installation for buildings & facilities, Mohammad Tawfeeq AL- Zuhairi (in Arabic), 2 <sup>nd</sup> ed. 2016. Dar Al Manahej Amman – Jordan.
<b>References:</b>	Watkins, A.J., Kitcher, Chris, Electrical Installation Calculations: Basic, Boston: Elsevier, 2011. - Atkinson, Bill, Electrical Installation Design, Oxford: Blackwell Publishing, 2002
<b>Course Description:</b>	The course is an elective requirement for all electrical, telecommunication and computer engineering students. It introduces the basic principles and design of electrical wiring and installations in buildings and industrial plants. Students will learn to solve and design engineering problems of wiring and installations circuits.
<b>Instructor:</b>	Dr. Ayman Agha <b>Email:</b> aagha@philadelphia.edu.com, aymanagha61@gmail.com <b>Office:</b> Engineering building, room 811, ext.: 2504

## Course Outlines:

Week	Topic
1	Introduction to projects concept and projects documentation, electrical installation codes, standards and regulations.
2	Methods of cables installation, cables types, busbars and bus duct.
3,4	Calculation of the cross-sectional areas of cables, cables trays and busbars, considering de-rating factors, protection and calculations against fault current.
5	Estimate the demand on electrical power and energy, allocation of main substation.
6,7	Basic parameters used in lighting, lighting technology and type of lamps, lighting design for indoor and outdoor objects.
8	Electrical installation accessories, fuses, circuit breakers types and characteristics.
9, 10	Earthing and types of earthing systems, earthing impedance and sizing of the earthing conductors.
11	Three-phase short-circuit current calculation at low voltage installations, effective discrimination of protective devices.
12	Distribution boards design for houses and large buildings.
13	Substation design (demand on power, transformer, circuit breakers and cables ratings).
14	Electrical tariffs type of electrical energy supplied to the consumers
15	Reactive power compensation in industrial plants.
16	Innovations in Electric Installations, and Revision.

## Course Learning Outcomes with reference to ABET Student Outcomes:

Upon successful completion of this course, student should:

1.	Introduction to the projects, electrical installation codes, standards and regulations.	[1, 4, 6]
2.	Electrical installation, cables and wires, switches and lighting circuit control, trunks and conduits outlets, sockets, distribution boards, voltage drop calculations.	[1, 4, 6]
3.	Introduction to electromagnetic radiation and light, light quantities. Electrical lamps and their applications, Illumination calculations.	[1, 4, 6]
4.	Protection devices, fuses, circuit breakers and relays.	[1, 4, 6]
5.	Emergency and standby sources, fire alarm systems and security systems in buildings.	[1, 4, 6]
6.	The electrical safety and earthing for human and equipment.	[1, 4, 6]
7.	Substation design (demand on power, transformer, circuit breakers, cables and distribution boards etc.)	[2, 4,5,6]
8.	Electrical energy tariff types and reactive power compensation in industrial plants.	[1, 6, 7]

## Assessment Guidance:

Evaluation of the student performance during the semester (total final mark) will be conducted according to the following activities:

**Sub-Exams:** The students will be subjected to midterm written exams during the semester.

**Quizzes:** (3-4) quizzes of (10) minutes will be conducted during the semester. The materials of the quizzes are set by the lecturer.

**Homework and projects:** Tutorials sheets will be assigned to the students and homework should be solved individually and submitted before or on a set agreed date.

Cheating by copying homework from others is strictly forbidden and punishable by awarding the work with zero mark.

**Final Exam:** The students will undergo a scheduled final exam at the end of the semester covering the whole materials taught in the course.

## Grading policy:

Midterm Exam	30%
Quizzes and Homework	30%
Final Exam	40%
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Total:	100%

## Attendance Regulation:

The semester has in total 45 credit hours. Total absence hours from classes and tutorials must not exceed 15% of the total credit hours. Exceeding this limit without a medical or emergency excuse approved by the deanship will prohibit the student from sitting the final exam and a zero mark will be recorded for the course. If the excuse is approved by the deanship the student will be considered withdrawn from the course.