



# Philadelphia University

Faculty of Engineering - Department of Electrical Engineering  
First Semester 2022/2023

## Course Details:

|                            |   |
|----------------------------|---|
| <b>Title:</b>              | Electric Circuits I (610211)  |
| <b>Prerequisite:</b>       | General Physics 2 (216132)  |
| <b>Credit Hours:</b>       | 3 credit hours (16 weeks per semester, approximately 45 contact hours)  |
| <b>Support Material</b>    | Pre-set Tutorials in order to solve problems set  |
| <b>Textbook:</b>           | James Nilson and Susan Riedel, Electric Circuits, 10 <sup>th</sup> edition, 2014, Pearson.  |
| <b>References:</b>         | <ul style="list-style-type: none"><li>W. Hayt and J. Kemmerly, Engineering Circuits Analysis, 5<sup>th</sup> edition, Mcgraw-Hill College, 1993.</li><li>IEEE Transactions on Electric Circuits</li></ul>   |
| <b>Course Description:</b> | <p>The main goals of this course is to introduce concepts of Electric circuits by studying the following main topics; electric circuit elements, techniques of circuit analysis, transient conditions, and the steady states analysis. At the completion of this course the student should be able to:</p> <ul style="list-style-type: none"><li>Understand the principle of electric circuit design and application.</li><li>Comprehend the principles of DC and AC circuits.</li><li>Understand the techniques to analyze different circuit configuration</li></ul> |

## Course Outlines:

| Week   | Topic  |
|--------|--|
| 1,2    | Introduction: Electric Circuits Variables and Elements |
| 3,4    | Simple Resistive Circuits                              |
| 5      | Techniques of Analysis: Node-Voltage Method            |
| 6      | DC Techniques of Analysis: Mesh Current Analysis       |
| 7      | Techniques of Analysis: Thevinins and Nortons          |
| 8      | Maximum Power Transfer Theory                          |
| 9      | Inductors and capacitors: Series and Parallel          |
| 10, 11 | RL, RC: Transient state analysis                       |
| 12     | Steady State Analysis                                  |
| 13     | Sinusoidal Response                                    |
| 14     | Complex Numbers  |
| 15, 16 | Frequency Domain Circuits: Impedance and Admittance    |

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

Upon successful completion of this course, student should:

|    |   |     |
|----|---|-----|
| 1. | Know the various types and their elements of electric circuits.   | [1] |
| 2. | Apply different techniques to analyze electric circuits.          | [1] |
| 3. | Solve problem of different electric circuits                      | [1] |
| 4. | Derive equations related to the circuit's performance and design. | [1] |

## 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 a midterm scheduled written exams during the semester.

**Quizzes:** quizzes of (10-15) minutes will be conducted during the semester. The materials of the quizzes are set by the lecturer.

**Homework and projects:** Tutorials sheets will be handed out to the students and homework should be solved individually and submitted before or on a set agreed date. Student may be assigned to present project(s).

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% |
| Class Work   | 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.

September 2022