

Electric Circuit 2

Syllabus Number

4D202

Special Subjects

Elective 2 credit

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1. Course Description

It is not possible to understand electronics and to design electronic circuits without the knowledge of how to analyze electric circuits.

Based on the knowledge the students acquired in “Electric Circuit 1”, students will learn how to analyze the alternating circuits with the Symbolic Solution Method, the Transient Phenomena, and the essential circuit theories. Students will deepen their understanding of electric circuit theories through lab works and classroom lectures.

2. Course Objectives

The objective of the class entitled “Electric Circuit 2” which follows “Electric Circuit 1”, is to learn Alternating Circuit Analysis through the Symbolic Solution Method, the Transient Phenomena and important circuit theories. Students will learn this process through comprehensive electric circuit theories as well as through relevant mathematical instruction.

The objectives of the students in this lesson are to be able to do the followings: (1) AC circuit analysis by using symbol method and transient phenomenon. (2) Necessary mathematical knowledge and application of electric circuit theory. (3) Calculation of impedance of circuit between two terminals

3. Grading Policy

Students will be evaluated at 60% regular report and 40% report only if all reports are submitted. Feed back and additional explanations about points to be given when returning the report.

4. Textbook and Reference

Textbook

Masaru Nishimaki / Takeaki Mori / Toshihiko Arai Foundations of Electric Circuits

It is also used for electric circuit 1.

Mori Kita Publication ISBN 978-4-627-73253-7

5. Requirements(Assignments)

Students should write their report tasks by hand.

In the subject acquisition test, only the calculator can be brought in. Also, in the exam, questions similar to the report assignment will be presented.

6. Note

Students should prepare a scientific calculator.

7. Schedule

- [1] Serial connection of two terminal circuits:
Series connection of impedance and admittance
- [2] Parallel connection of two terminal circuits:
Parallel connection of impedance and admittance
- [3] AC Power (1) Instant Power Efficiency
- [4] AC power (2) reactive power and apparent power
- [5] Analysis of AC circuit (1) Kirchhoff's law
- [6] Analysis of AC circuit (2) Problem exercise of Kirchhoff's law
- [7] Theorem of the AC circuit (1) Thevenin's Theorem
- [8] Theorem of the AC circuit (2) Problem exercises of Thevenin's Theorem
- [9] Frequency characteristics of AC circuit (1) Frequency characteristics of circuit elements
- [10] Frequency characteristics of AC circuit (2) Impedance and admittance
- [11] Series resonance: resonance curve Q value
- [12] Parallel resonance: anti-resonance curve
- [13] Symmetric three-phase AC circuit (1) Polyphase AC
- [14] Symmetric three-phase AC circuit (2) Three-phase AC circuit
- [15] Non sinusoidal AC distortion wave