

# Electric Circuit 2

Syllabus Number

3E106

Basic Major Subjects

Elective Requisites 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", they 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 work and classroom lectures. This lesson is related to DP4E.

## 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 follow: (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.

Feedback will be given when the report is returned.

## 4. Textbook and Reference

Textbook

Masaru Nishimaki / Takeaki Mori / Toshihiko Arai Foundations of Electric Circuits (Japanese)

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

## 5. Requirements (Assignments)

Students who are planning to take electronics basic experiment 2 or electronics experiments should take this lecture.

## 6. Note

Students should prepare a scientific calculator.

## 7. Schedule

- [1] Sine wave AC and phasor display
- [2] AC circuit (1) : Impedance of series circuit
- [3] AC circuit (2) : Impedance of parallel circuit
- [4] AC circuit (3) : Series connection between two terminals
- [5] AC circuit (4) : Parallel connection between two terminals
- [6] AC circuit (5) : Resonant circuit series resonance
- [7] AC circuit (6) : Resonant circuit parallel resonance
- [8] Power in AC circuit
- [9] Intermediate test, Summary of the first half
- [10] Important Theorem of Circuit Theory (1): Kirchhoff's Law in AC Circuit
- [11] Important Theorem of Circuit Theory (2): Theory of Superposition in AC Circuit
- [12] Important Theorem of Circuit Theory (3) : Thevenin's theorem in AC Circuit  
The Norton's Theorem in AC Circuit
- [13] Important theorem of circuit theory (4) : Summary of various theorems
- [14] Frequency characteristics of AC circuits
- [15] Test, Summary