

# Basic Mathematics

Syllabus Number

3F112

Basic Major Subjects

Requisites 2 credit

WATANABE, Ryuji

## 1. Course Description

This course covers basic mathematics necessary in the following mathematical studies on a university level and specialized courses. The items are as follows: Exponential functions, logarithmic functions, trigonometric functions, vectors, complex numbers, and limits of sequences and functions.

The classes consist of lectures and exercises. Every class begins with solving problems as a review of the previous class. Students will give presentations on homework assignments in the classes.

This subject is related to the clause 3 of the diploma policy of the Department of Information and Electronic Engineering.

## 2. Course Objectives

This course aims to improve the basic knowledge of mathematics for scientists and engineers and to enhance students' overall mathematical levels by solving mathematical problems so that they can study textbooks in the following mathematics and specialized courses on their own.

## 3. Grading Policy

The term-end examination (80%) and presentations on homework assignments in the classes (20%) will be evaluated.

The acceptance line is accuracy rate of 60% in the above term-end examination and presentations on homework assignments.

## 4. Textbook and Reference

Textbook

Not designated.

Reference

"Mathematics II", "Mathematics B", "Mathematics III" Approved by the MEXT on a high school level.

## 5. Requirements(Assignments)

Students are required to review the lectures and to do the homework assignments.

## 6. Note

It is recommended for students to access the homework assignments on the LMS.

It is prohibited for students to refer the textbook and notebook in term-end examination and makeup examination.

## 7. Schedule

- [1] Exponential functions, Logarithmic functions : n-th power and n-th root, Law of exponent
- [2] Exponential functions, Logarithmic functions : Exponential functions, Logarithm, Logarithmic functions
- [3] Exponential functions, Logarithmic functions : Practices
- [4] Trigonometric functions : General angle and circular measure, Trigonometric functions
- [5] Trigonometric functions : Inverse trigonometric functions, Practices
- [6] Vectors : Definition of vectors, Operation of Vectors, Linearly independent and linearly dependent
- [7] Vectors : Components of vectors, Inner product, Outer product
- [8] Vectors : Practices
- [9] Complex numbers : Complex numbers, Complex planes
- [10] Complex numbers : de Moivre's theorem, Euler's formula
- [11] Complex numbers : Practices
- [12] Limits of sequences and functions : Sequences and limits of sequences, Series
- [13] Limits of sequences and functions : Limits of functions
- [14] Limits of sequences and functions : Practices
- [15] Review, Term-end examination