

# Mathematics 1

Syllabus Number

5B110

Basic Major Subjects

Elective Requisites 2  
credit

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## 1. Course Description

This course deals with the exponential function, logarithmic function, trigonometric function, number of possible outcomes, probability, and random variable, basing on the textbook. Participants attend lectures; they, as required, receive handouts and take quizzes in classes.

This course also enhances participants' knowledge of, skill of, and attitude to DP1 and DP2.

## 2. Course Objectives

At the end of the course, participants are expected to:

(1) understand the definition, law, mutual relationship of the exponential and logarithmic functions and calculate by using them; understand the quality of functions and utilize them.

(2) understand the definition and quality of trigonometric functions and the circular measure and make a basic calculation by using them; understand the trigonometric addition theorem and utilize the sine theorem and the cosine theorem.

(3) confirm understanding basic matters of the number of possible outcomes.

(4) understand the definition of the probability and the view of random variables and calculate fundamental statistics.

## 3. Grading Policy

Grading will be decided based on quizzes in classes (15%), the midterm evaluation (35%), and the final evaluation (50%). Only participants earn at more than 90 points out of 100 can receive the S evaluation. A quiz in a class will be returned and noted in its next class. Model answers and explanatory notes of the midterm and final examinations will be on LMS after these examination days.

## 4. Textbook and Reference

Textbook

TASHIRO, Yoshihiro Textbook Basic Mathematics of Engineering

Some handouts are distributed as required.

Morikita Publication  
ISBN 978-4-627-04912-3

## 5. Requirements(Assignments)

Preparations and reviews for more than an hour are required. If necessary, assignments with model answers are distributed in the end of classes. Such an assignment is about similar questions to a next quiz. Utilize these materials for studies. Take the midterm and final examinations with understanding quizzes well. Solve exercises in the textbook.

## 6. Note

Ask questions without hesitation. Participants not understanding well enough can be supported by the class teacher and staffs at Learning Support Room.

## 7. Schedule

- [1] Course Guidance: distributing handouts and explaining the course procedure  
Quiz on functions
- [2] Functions: odd function and even function
- [3] Exponential function 1: exponential law and exponential expansion
- [4] Exponential function 2: exponential function and exponential calculation  
Quiz on the 3rd and 4th classes (30 minutes)
- [5] Logarithmic function 1: logarithm and logarithmic function
- [6] Logarithmic function 2: number of digits and logarithmic calculation
- [7] Logarithmic function 3: definition of inverse function and utilization of graphs  
Quiz on 5th, 6th, and 7th classes (30 minutes)
- [8] Midterm examination (pp. 70-100)
- [9] Trigonometric function 1: definition and quality of trigonometric function
- [10] Trigonometric function 2: addition theorem and composition of trigonometric functions  
Quiz on the 9th and 10th classes
- [11] Number of possible outcomes and binomial theorem
- [12] Probability: definition and calculation of probability  
Quiz on the 11th and 12th classes
- [13] Random variable 1: random variable and probability distribution
- [14] Random variable 2: mean value and standard deviation  
Quiz on the 13th and 14th classes
- [15] Summary of the course and problem exercises