Applied Mathematics

1. Course Description

This course provides an introduction to differential equations, Laplace transform and Fourier analysis necessary in the following specialized courses. The items are as follows: differential equation and its solutions, method of separation of variables, homogeneous differential equation, linear differential equation, exact differential, linear differential equation of the second order, Laplace transform, inverse Laplace transform, wave equation, conductional equation of heat, Laplace equation, series expansion of functions, Fourier expansion, convergence of Fourier series, solution method of differential equation by series expansion.

The classes consist of lectures and exercises. 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 in order that they can study textbooks in 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
Y.Tashiro "Engineering Mathematics: Applied Mathematics" Morikita Publishing (2002) in Japanese. (ISBN 4-627-04951-2)
Y.Tashiro "Engineering Mathematics: Calculus (2nd edition)" Morikita Publishing (1999) in Japanese. (ISBN 4-627-04932-3)
Reference
Unnecessary

5. Requirements(Assignments)

Students are required to review the lectures and to do the homework assignments.
Preparation of calculus of the functions of one valuable on a university level is also required.

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]   Differential equations : Differential equation and its solutions, Method of separation of variables
[2]   Differential equations : Homogeneous differential equation, Linear differential equation
[3]   Differential equations : Exact differential, Linear differential equation of the second order
[4]   Differential equations : Exercises
[5]   Laplace transform : Laplace transform
[6]   Laplace transform : Inverse Laplace transform
[7]   Laplace transform : Wave equation
[8]   Laplace transform : Conductional equation of heat, Laplace equation
[9]   Laplace transform : Exercises
[10]   Fourier analysis : Series expansion of functions
[11]   Fourier analysis : Fourier expansion
[12]   Fourier analysis : Convergence of Fourier series
[13]   Fourier analysis : Solution method of differential equation by series expansion, Wave equation
[14]   Fourier analysis : Exercises
[15]   Review, Term-end examination