Mathematics 2

WATANABE, Ryuji

1. Course Description

   This course provides an introduction to calculus of the functions of one variable, which is necessary for the following mathematical courses and specialized courses. The items are as follows: Derivative, increase/decrease and maximum/minimum of functions, continuity of functions, derivative of quotients, derivative of composite functions, derivative of wide variety of functions, mean value theorem, derivative of second order, derivative of inverse functions, derivative of functions represented by parameters, limit value of indeterminate forms, Taylor's expansion, indefinite integral, definite integral, fundamental theorem of calculus, area and volume, length of curved lines, and improper integral.
   The classes consist of lectures and exercises. Every class begins by 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 clauses 1 and 2 of the diploma policy of the Department of Biosciences.

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: Calculus (2nd edition)"   Morikita Publishing (1999) in Japanese. (ISBN 4-627-04932-3)
Reference
   "Mathematics Ⅱ", "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]	Differentiation of the functions of one variable : Derivative
[2]	Differentiation of the functions of one variable : Increase/decrease and maximum/minimum of functions
[3]	Differentiation of the functions of one variable : Continuity of functions
[4]	Differentiation of the functions of one variable : Derivative of quotients, Derivative of composite functions
[5]	Differentiation of the functions of one variable : Derivative of wide variety of functions
[6]	Differentiation of the functions of one variable : Mean value theorem, Derivative of second order
[7]	Differentiation of the functions of one variable : Derivative of inverse functions
[8]	Differentiation of the functions of one variable : Derivative of functions represented by parameters, Limit value of indeterminate forms
[9]	Differentiation of the functions of one variable : Taylor's expansion
[10]	Integration of the functions of one variable : Indefinite integral
[11]	Integration of the functions of one variable : Indefinite integral of wide variety of functions
[12]	Integration of the functions of one variable : Definite integral
[13]	Integration of the functions of one variable : Fundamental theorem of calculus
[14]	Integration of the functions of one variable : Area and volume, Length of curved lines, Improper integral
[15]	Review, Term-end examination