

Course Description

Department of Mathematics

Nature of the course ■ required □ elective		Area □ Algebra □ Analysis □ Geometry □ Statistics □ Applied Mathematics □ Discrete Mathematics □ Others			
Calculus □ Calculus A ■ Calculus B					
Course number	201 101B1	Section number	07	Number of credits	3
Course title	CALCULUS (GENERAL MATHEMATICS) (B)(1)				
Instructor	Kuang-Fu Tian [田光復]				

I. Contents :

I. Differentiation and Continuity of function of a real variable

1. History of calculus and some elementary prerequisites in analytical geometry and algebra.
2. Concept of infinitesimal and the concept of differentiation.
3. Differentiability and Continuity. First order approximation of a function value near a known function value.
4. Differentiation rules, arithmetic rules, and chain rule of elementary functions. Differentiation of inverse function.
5. Roll's theorem, mean value theorem, intermediate value theorem.
- 6 Graphing of rational functions, trigonometric and inverse functions.
7. Extrema problems of continuous and differentiable functions. Applications of this extremal calculus .
- 8 Implicit differentiation of functions. How to locate the tangent line to a conics.

II. Integration

- 9.Partition and integration of a continuous function, upper and lower sums,Riemann sums to prove arithmetic laws of integration. Fundamental theorem of calculus.
10. Elementary indefinite integrals of elementary functions.

II. Course prerequisite :

III. Reference material (textbook(s)) :

Reference material (textbook(s)) :

書名 : Differential Equations

作者 : by P. Blanchard, R. Devaney, G. Hall

出版 : Thomson Learning

IV. Grading scheme :

Exams(80-100%) and other evaluations such as provisional tests (0-20%).

V. Others :

VI. Course Goal :

Understand the use of infinitesimals, derivatives and integrations of functions and numerical methods in approximating a solution. The skills in calculus as a preparatory discipline in application to other field. Understand the value of a differential equation in treating problems in natural phenomena.