

Course Description(暫定)

Department of Mathematics

Nature of the course <input checked="" type="checkbox"/> required <input type="checkbox"/> elective	Area 麻煩老師勾選類別，或直接填寫_____。 <input type="checkbox"/> Algebra <input type="checkbox"/> Analysis <input type="checkbox"/> Geometry <input type="checkbox"/> Statistics <input type="checkbox"/> Applied Mathematics <input type="checkbox"/> Discrete Mathematics <input type="checkbox"/> Others				
Calculus <input checked="" type="checkbox"/> Calculus A <input type="checkbox"/> Calculus B					
Course number	201 101A1	Section number	08-13	Number of credits	4
Course title	Calculus				
Instructor	劉崑山(08)、余正道(09)、張秋俊(10)、莊正良(11)、王藹農(12)、張志中(13)				

I. Contents :

上學期：單變數微積分			
章節	周次	課次	課程進度
1. Functions and Models	第一周 9/15-9/19	1	[1.5] Exponential Functions [1.6] Inverse Functions and Logarithms
		2	[2.1] The Tangent and Velocity Problems [2.2] The Limit of a Function
2. Limits and Derivatives	第二周 9/22-9/26	1	[2.3] Calculating Limits Using the Limit Laws [2.4] The Precise Definition of a Limit
		2	[2.5] Continuity [2.6] Limits at Infinity; Horizontal Asymptotes [2.7] Derivatives and Rates of Change
3. Differentiation Rules	第三周 9/29-10/3	1	[2.8] The Derivative as a Function [3.1] Derivatives of Polynomials and Exponential Functions
		2	[3.2] The Product and Quotient Rules [3.3] Derivatives of Trigonometric Functions
3. Differentiation Rules	第四周 10/6-10/10	1	[3.4] The Chain Rule [3.5] Implicit Differentiation [3.6] Derivatives of Logarithmic Functions
		2	10/10 (五) 國慶紀念日（放假一天）；緩衝時間
4. Applications of Differentiation	第五周 10/13-10/17	1	[3.7] Rates of Change in the Natural and Social Sciences (※) [3.8] Exponential Growth and Decay [3.9] Related Rates
		2	[3.10] Linear Approximations and Differentials [3.11] Hyperbolic Functions (※) [4.1] Maximum and Minimum Values
4. Applications of Differentiation	第六周 10/20-10/24	1	[4.2] The Mean Value Theorem [4.3] How Derivatives Affect the Shape of a Graph
		2	[4.4] Indeterminate Forms and L'Hospital's Rule

	第七周 10/27-10/31	1	[4.5] Summary of Curve Sketching [4.6] Graphing with Calculus and Calculators [4.7] Optimization Problems
		2	[4.8] Newton's Method (※) [4.9] Antiderivatives
5. Integrals	第八周 11/3-11/7	1	[5.1] Areas and Distances [5.2] The Definite Integral
		2	[5.3] The Fundamental Theorem of Calculus [5.4] Indefinite Integrals and the Net Change Theorem
6. Applications of Integration	第九周 11/10-11/14	1	[5.5] The Substitution Rule [6.1] Areas between Curves
		2	[6.2] Volumes [6.3] Volumes by Cylindrical Shells 11/10-11/14 期中考週；11/15（六）校慶
	第十周 11/17-11/21	1	緩衝時間
		2	[6.4] Work (※) [6.5] Average Value of a Function 期中考 11/22（六）9：00～11：30 考試範圍 1.5～5.5
7. Techniques of Integration	第十一周 11/24-11/28	1	[7.1] Integration by Parts [7.2] Trigonometric Integrals
		2	[7.3] Trigonometric Substitution
	第十二周 12/1-12/5	1	[7.4] Integration of Rational Functions by Partial Fractions
		2	[7.5] Strategy for Integration [7.6] Integration Using Tables and Computer Algebra Systems [7.7] Approximate Integration
	第十三周 12/8-12/12	1	[7.8] Improper Integrals
		2	緩衝時間
8. Further Applications of Integration	第十四周 12/15-12/19	1	[8.1] Arc Length [8.2] Area of a Surface of Revolution
		2	[9.1] Modeling with Differential Equations [9.2] Direction Fields and Euler's Method
9. Differential Equations	第十五周 12/22-12/26	1	[9.3] Separable Equations [9.4] Models for Population Growth
		2	[9.5] Linear Equations [9.6] Predator-Prey Systems (※)
10. Parametric Equations and Polar Coordinates	第十六周 12/29-1/2	1	[10.1] Curves Defined by Parametric Equations [10.2] Calculus with Parametric Curves
		2	1/1(四) 元旦放假；緩衝時間
	第十七周 1/5-1/9	1	[10.3] Polar Coordinates [10.4] Areas and Lengths in Polar Coordinates

		2	緩衝時間
			期末考 1/10 (六) 9:00~11:30 考試範圍 CH6~CH10

II. Course prerequisite :

High School Mathematics

III. Reference material (textbook(s)) :

James Stewart, Calculus Early Transcendentals, 6th edition.

IV. Grading scheme :

Midterm exam: 40%, Final exam: 40%, Quizzes and/or homework: 20%

V. Others :

☆08-12班：上課時間：三78五12、實習課時間：三9

13班： 上課時間：二78四56、實習課時間：二9

☆各班實習課分組教室：

★若末一碼為0，請往前一碼來計算，如：Bxxxxxx20，則以2除；Bxxxxx300，則以3除。

班別	小組編號	教學助理	時間	小組教室	備 註
08	1	呂楊凱	三(九)	綜合 101	學號末一碼除以3餘0者
	2	陳志偉		綜合 102	學號末一碼除以3餘1者
	3	陳聖華		綜合 103	學號末一碼除以3餘2者
09	1	黃名鉞	三(九)	新生 302	學號末一碼除以3餘0者
	2	劉恩臨		新生 303	學號末一碼除以3餘1者
	3	粘志章		新生 304	學號末一碼除以3餘2者
10	1	廖又霆	三(九)	新生 401	學號末一碼除以3餘0者
	2	李宗儒		新生 402	學號末一碼除以3餘1者
	3	蕭辰翰		新生 403	學號末一碼除以3餘2者
11	1	金明佑	三(九)	新生 404	學號末一碼除以3餘0者
	2	林雨亭		新生 501	學號末一碼除以3餘1者
	3	林書勤		新生 502	學號末一碼除以3餘2者
12	1	江政融	三(九)	新生 503	學號末一碼除以3餘0者
	2	高連庸		新生 505	學號末一碼除以3餘1者
	3	林立人		新生 204	學號末一碼除以3餘2者
13	1	高連庸	二(九)	新生 401	學號末一碼除以4餘0者
	2	郭孝豪		新生 402	學號末一碼除以4餘1者
	3	徐義程		新生 403	學號末一碼除以4餘2者
	4	楊策仲		新生 404	學號末一碼除以4餘3者

☆微積分甲統一教學網站 <http://www.math.ntu.edu.tw/~cala971/>

☆各班外系助教 Office Hour 時間：詳見統一教學網站公佈。

☆習題：習題繳交與否依各授課教師規定；習題解答將於公佈於統一教學網站。

VI. Course Goal :

Study the process of approximation and its limitation (errors), learn the tools and techniques for analyzing regular mappings with applications, and deepen the understanding of elementary functions.