# 個別課程英文授課大綱

表單編號：QP-T02-07-11

保存年限：10 年

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| 課程名稱<br>Course Title | （中文）微積分 | | 開課單位<br>Departments | Business Administration | Time |
| | （英文）Calculus | | 修課對象<br>Target Students | First Year | 9:10~12:00<br>Tuesday |
| 授課教師<br>Instructor | 陸行<br>Hsing Luh<br>slu@nccu.edu.tw | 果夫樓<br>080218 室<br>ext 67373 | Office Hours<br>13:10~14:00<br>Monday, Wednesday | 學分數<br>Credit(s) | 3 |
| Teaching Assistants | | 演習課<br>Calculus Tutorial Time | 15:10~16:00<br>Monday | Office<br>志希樓一樓<br>研究生室 | TA Office Hours<br>12:10~13:00<br>Tuesday |
| 課程目標<br>Course Objectives | The purpose of the course is that the student will master selected concepts and methods from calculus; the scope will be approximately equivalent to a one-semester college course in calculus. This one-semester course does not involve any trigonometry. The emphasis is on formulae, their interpretation and their use in application. In short, the course will seek to balance conceptual understanding, computational skills, and the utilization of technology. | | | | |
| 課程大綱<br>Course Description | ● Functions and Its Applications<br>● Derivatives and Its Applications<br>● Integration and Its Applications | | | | |

上課進度 Weekly Course Schedule

| Class Dates | Sections | Material Covered, Assignments, etc. |
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| 2/21 | Prerequisites<br>1.1<br>1.2 | **Quiz 1 (Pre-reqs)**<br>Real Numbers, Inequalities, and Lines<br>Exponents |
| 2/28 | National Holiday | |
| 3/6 | 1.3<br>1.4<br>2.1 | Functions: Linear and Quadratic<br>Functions: Polynomial, Rational, and Exponential<br>Limits and Continuity |
| 3/13 | 2.2<br>2.3<br>2.4 | Rates of Change, Slopes, and Derivatives<br>Some Differentiation Formulas<br>The Product and Quotient Rules |
| 3/20 | 2.5<br>2.6<br>2.7 | Higher-Order Derivatives<br>The Chain Rule and the Generalized Power Rule<br>Nondifferentiable Functions |
| | | 3/26 Turn in Homework 1 |
| 3/27 | <br>3.1<br>3.2 | **Quiz 2 ( 1.1~2.7)**<br>Graphing Using the First Derivative<br>Graphing Using the First and Second Derivatives |
| 4/3 | 3.3<br>3.4 | Optimization<br>Further Applications of Optimization |
| 4/10 | 3.5<br>3.6 | Optimizing Lot Size and Harvest Size<br>Implicit Differentiation and Related Rates |
| 4/17 | 4.1<br>4.2<br>4.3 | Exponential Functions<br>Logarithmic Functions<br>Differentiation of Logarithmic and Exponential Functions |
| 4/24 | **Midterm Examination** | Video Recording |
| | | 4/30 Video Recording |
| 5/1 | 4.4<br><br>5.1<br>5.2 | Two Applications to Economics: Relative Rates and Elasticity of Demand<br>Antiderivatives and Indefinite Integrals<br>Integration Using Logarithmic and Exponential Functions |

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| | 5/8 | 5.3<br>5.4<br><br>5.5 | Definite Integrals and Areas<br>Further Applications of Definite Integrals: Average Value and Area Between Curves<br>Two Applications to Economics: Consumers' Surplus and Income Distribution<br>Video Recording |
| | 5/15 | 5.6<br>6.1<br>6.2 | Integration by Substitution<br>Integration by Parts<br>Integration Using Tables |
| | 5/22 | 5/21 Homework 2<br>6.3<br>6.4 | **Quiz 3 ( 4.1~5.4)**<br>Improper Integrals<br>Numerical Integration |
| | 5/29 | 6.5<br>7.1<br>7.2 | Differential Equations<br>Functions of Several Variables<br>Partial Derivatives |
| | 6/5 | 7.3<br>7.4<br>7.5 | Optimizing Functions of Several Variables<br>Least Squares<br>Lagrange Multiples and Constrained Optimization<br>Check all student grades before final exam |
| | 6/12 | 7.6<br>7.7 | Total Differentials and Approximate Changes<br>Multiple Integrals |
| | 6/19 | **Final Examination** | Video Recording |
| 教學方式 Instructional Method | ● In order for this to work properly you *must* come prepared to work the exercises in class. This means that you have read and understood the assigned reading since class exercises will be based on the material you read.<br>● Working together with a partner will allow both of you to learn the material. If you don't understand ask the other to explain; your partner may be able to answer questions better than me. (By the way, feel free to criticize your partner if you think he or she came unprepared.)<br>● Homework (due the next class period) will be assigned each day based on the material you read to prepare for class and based on the in-class exercises. The intention is that you will leave class knowing how to do the homework assigned.<br>● Generally I will not go over assigned homework problems in class. If you have homework questions you can either seem me outside of class during my office hours, arrange an alternate time to see me outside of class, check out the math workshop, or e-mail me questions.<br>● Part of each class you'll be working (with a partner) on exercises which are intended to lead you through the process of learning and understanding the course material. The best way to *learn* math is to *do* math.<br>● All students are arranged to take a seat according to the seat chart in the classroom. | | |
| 課程要求 Course Requirements | ● No food in class.<br>● Be present and on-time for every class. Note: Absences due to legitimate university sponsored events will not be counted provided I receive notification ahead of time.<br>● Participate in classroom activities and discussions.<br>● Maintain a math notebook that includes notes, hand-outs, classwork, and homework.<br>● Complete all classwork, homework.<br>● The math tutorial: It is the student's responsibility to attend the tutorial .<br>● Please -Switch off your cell phones and no texting in class!<br>● No surfing the web! | | |
| 評量方式 Evaluation | ● Grading: There will be one midterm exam along with a final exam. It is worth 35% of your grade. Makeup exams are allowed only in extreme circumstances and we must be notified in advance.<br>● The other 30% of your grade will be determined by a combination of weekly homework, quizzes and classroom participation; 20% will be taken off from the delayed homework or the makeup quizzes (new problems). | | |

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| | ● The final exam counts for 35% of your grade.<br>● A class average from 91 – 100% will be at least an A-, 81 – 90% at least a B-, and 71 – 80% at least a C-.<br>● Academic Conduct: Students are expected to be familiar with National Chengchi University policies on grading standards and student conduct, including the consequences for students who violate standards of academic honesty. |
| 教材及參考書目<br>Textbooks & Suggested Materials | ● Textbook<br>Brief Applied Calculus Fifth Edition by Geoffrey C. Berresford and Andrew M. Rockett.<br>● References<br>1. Calculus, Sixth Edition by Ron Larson, Bruce Edwards, David Falvo<br>2. Applied Calculus for Business, Economics, and the Social and Life Sciences, Expanded Edition, Tenth Edition by Laurence D. Hoffmann, Gerald L Bradley<br>3. Calculus for Business, Economics, Life Sciences and Social Sciences Eleventh Edition by R.A. Barnett, M.R. Ziegler, K.E. Byleen<br>4. Calculus, Fifth Edition by S. T. Tan. |
| 課程相關連結網址<br>Course Website | http://www.cengage.com/math/berresford |
| 備註<br>Remarks | ● Prerequisites: 3 year high school mathematics.<br>In particular, it's extremely important to have strong algebra skills to be successful in this course.<br>● Rules for Homework Assignments<br>1 Your name (or names – see below), date and homework assignment number MUST appear clearly at the top of the page.<br>2 For each problem write down the page number and question number, copy the question, show work indicating how you got the answer, and "box" the answer. I want to see that you actually solved the problem instead of merely copying down the answer in the back of the book.<br>3 Do NOT rip pages out of a spiral bound note book. Do not use scrap paper.<br>4 Please staple or clip multiple pages together.<br>● Homework not conforming to the above will not be graded.<br>● Late homework will not be accepted. This is because it's important to keep up with the material<br>● How to Succeed in this Course<br>1 Complete each reading assignment before it's covered in class. Read each assignment three times. First time read it straight through to get the general picture of the material. Second time read it slowly and carefully to get all the details. Third time read it to review what you read and take notes on the 3rd read through!<br>2 Pay particular attention to the Examples in the text which are excellent. .<br>3 Do all the homework problems; write them up neatly – and don't get behind<br>4 3 to 1 rule: For every hour in class spend 3 hours studying outside of class<br>Write down important definitions, theorems, formulas, and techniques/examples for solving standard math. |