

# 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)管理數學<br><br>(英文)Mathematics with Business Applications  |                         |                         |
| 授課教師<br>Instructor             | Li-Ming Chen 陳立民  | 開課單位<br>Departments     | Business Administration |
| 學分數<br>Credit(s)               | 3 Credits   | 修課對象<br>Target Students | Sophomore, Junior       |
| 課程目標<br>Course Objectives      | This is an introductory course on providing the basic knowledge of linear algebra, linear programming, calculus, non-linear functions, and probability theory. Students will also learn the applications in different business and operational areas.   |                         |                         |
| 課程大綱<br>Course Description     | This course will include the following topics<br>1. Basic mathematical concepts such as sets, functions, vectors, and Matrices<br>2. Introduction of Linear Algebra<br>3. Applications and formulations of Linear Programming (LP)<br>4. Simplex algorithm, duality, and sensitivity analysis<br>5. Solving LP problems by software<br>6. Fundamentals and applications of probability<br>7. Basic concept of derivatives<br>8. Advanced Topics (Markov Chain, Nonlinear Programming)   |                         |                         |
| 教學方式<br>Instructional Method   |   |                         |                         |
| 上課進度<br>Weekly Course Schedule | Week 1 Course Overview<br>Week 2 Linear Algebra Review<br>Week 3 Systems of Linear Equations and Matrices<br>Week 4 Game Theory<br>Week 5 Linear Programming (LP) Formulation and Applications<br>Week 5 Graphical Interpretation and Standard Form of LP<br>Week 6 Simplex Method<br>Week 7 Duality and Sensitivity Analysis<br>Week 8 Solving LP problems through Excel and Optimization Software (AMPL)<br>Week 9 Midterm Exam<br>Week 10 Midterm Exam Review and Game Theory Movie Watching<br>Week 12 Axioms of Probability<br>Week 13 Conditional Probability and Independence<br>Week 14 Discrete Random Variables<br>Week 15 Continuous Random Variables<br>Week 16 Markov Chain and Introduction to Non-linear Function<br>Week 17 Presentation and Review Session<br>Week 18 Final Exam |                         |                         |

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| 教學方式<br>Instructional Method                  | 1. Lecture each chapter through PowerPoint and blackboard<br>2. Encourage students to demonstrate their own thought and communicate with peers.  |
| 課程要求<br>Course Requirements                   | 1. Students will be given several homework assignments. All the homework will be collected at the beginning of the class. No late homework assignments will be accepted except the unanticipated absences such as the illness with a doctor's report and family death.<br>2. The mid-term exam will be given during the class period and the final exam will be held in the official examination period.<br>3. Students are encouraged to discuss and share the ideas of course materials and homework. However, all the work needs to be accomplished individually without help. In other words, copying someone's homework solution is strictly not allowed. |
| 評量方式<br>Evaluation                            | Mid-term Exam (25%), Final Exam (35%), Quizzes & Assignments (20%), Presentation (10%) and Class Participation (10%)   |
| 教材及參考書目<br>Textbooks &<br>Suggested Materials | S. Waner and S. Costenoble. <i>Finite Mathematics</i> , 4 <sup>th</sup> edition, Thomson.<br><b>Suggested Reference:</b><br>W. Winston and M. Venkstaramanan. <i>Introduction to Mathematical Programming</i> , Thomson. F. Hillier and G. Lieberman. <i>Introduction to Operations Research</i> , McGraw-Hill.<br>S. Ross. <i>A first Course in Probability</i> , Prentice Hall.  |
| 課程相關<br>連結網址<br>Course Website                | TBA(Through the E-learning System)   |
| 備註<br>Remarks                                 | (Empty)  |