

 國立東華大學  
教學計劃表 Syllabus

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| 課程名稱(中文)<br>Course Name in Chinese                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 微積分(一)                                                                                                  |                             |    | 學年/學期<br>Academic Year/Semester    | 114/1     |
| 課程名稱(英文)<br>Course Name in English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Calculus(I)                                                                                             |                             |    |                                    |           |
| 科目代碼<br>Course Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | MSF_10110                                                                                               | 系級<br>Department & Year     | 學一 | 開課單位<br>Course-Offering Department | 應用數學系     |
| 修別<br>Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 學程 Program                                                                                              | 學分數/時間<br>Credit(s)/Hour(s) |    | 3.0/3.0                            |           |
| 授課教師<br>Instructor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | /黃灝勻                                                                                                    |                             |    |                                    |           |
| 先修課程<br>Prerequisite                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                         |                             |    |                                    |           |
| 課程描述 Course Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                         |                             |    |                                    |           |
| <p>In this course, students will be expected to be familiar with:</p> <p>(1) Functions, Graphs, and Limits<br/>(2) Differentiation<br/>(3) Applications of the Derivative<br/>(4) Exponential and Logarithmic Functions<br/>(5) Integration and Its Applications<br/>*** This course will be taught in English ***</p> <p>***"Cheating, including using cell phones or other electronic devices during exams, is strictly prohibited. If caught, the exam score will be **zero (0)**. Make-up exams or homework will only be provided if the student has requested a leave in advance with a justifiable reason."**</p> |                                                                                                         |                             |    |                                    |           |
| 課程目標 Course Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                         |                             |    |                                    |           |
| The purpose is to facilitate the students with tools in higher mathematics for later use in finance courses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                         |                             |    |                                    |           |
| 圖示說明Illustration：● 高度相關 Highly correlated ○ 中度相關 Moderately correlated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                         |                             |    |                                    |           |
| 授課進度表 Teaching Schedule & Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                         |                             |    |                                    |           |
| 週次Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 內容 Subject/Topics                                                                                       |                             |    |                                    | 備註Remarks |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Chapter 1: Functions, Graphs, and Limits<br>Limits<br>Continuity                                        |                             |    |                                    |           |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Chapter 2: Differentiation<br>The Derivative and the Slope of a Graph<br>Some Rules for Differentiation |                             |    |                                    |           |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Rates of Change: Velocity and Marginals<br>The Product and Quotient Rules<br>Quiz 1                     |                             |    |                                    |           |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | The Product and Quotient Rules<br>The Chain Rule                                                        |                             |    |                                    |           |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Higher-Order Derivatives<br>Implicit Differentiation<br>Related Rates                                   |                             |    |                                    |           |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 期中考試 Midterm Exam (I)                                                                                   |                             |    |                                    |           |

|    |                                                                                                                                                                       |  |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 7  | Chapter 3: Applications of the Derivative<br>Increasing and Decreasing Functions<br>Extrema and the First-Derivative Test<br>Concavity and the Second-Derivative Test |  |
| 8  | Optimization Problems<br>Business and Economics Applications<br>Asymptotes                                                                                            |  |
| 9  | Curve Sketching: A Summary<br>Differentials and Marginal Analysis<br>Quiz2                                                                                            |  |
| 10 | Chapter 4: Exponential and Logarithmic Functions<br>Exponential Functions<br>Natural Exponential Functions                                                            |  |
| 11 | Derivatives of Exponential Functions<br>Logarithmic Functions                                                                                                         |  |
| 12 | 期中考試 Midterm Exam (II)                                                                                                                                                |  |
| 13 | Derivatives of Logarithmic Functions<br>Exponential Growth and Decay                                                                                                  |  |
| 14 | Chapter 5: Integration and Its Applications<br>Antiderivatives and Indefinite Integrals<br>Integration by Substitution and the General Power Rule                     |  |
| 15 | Exponential and Logarithmic Integrals<br>Area and the Fundamental Theorem of Calculus<br>Quiz3                                                                        |  |
| 16 | Area of a Region Bounded by Two Graphs<br>The Definite Integral as the Limit of a Sum                                                                                 |  |
| 17 | 期末考試 Final Exam                                                                                                                                                       |  |
| 18 |                                                                                                                                                                       |  |

#### 教學策略 Teaching Strategies

- ☐ 課堂講授 Lecture
 ☐ 分組討論 Group Discussion
 ☐ 參觀實習 Field Trip  
☐ 其他 Miscellaneous:

#### 教學創新自評 Teaching Self-Evaluation

##### 創新教學(Innovative Teaching)

- ☐ 問題導向學習(PBL)
 ☐ 團體合作學習(TBL)
 ☐ 解決導向學習(SBL)  
☐ 翻轉教室 Flipped Classroom
 ☐ 磨課師 Moocs

##### 社會責任(Social Responsibility)

- ☐ 在地實踐 Community Practice
 ☐ 產學合作 Industry-Academia Cooperation

##### 跨域合作(Transdisciplinary Projects)

- ☐ 跨界教學 Transdisciplinary Teaching
 ☐ 跨院系教學 Inter-collegiate Teaching

- ☐ 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

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| 學期成績計算及多元評量方式 Grading & Assessments                                                                                                                   |                    |                    |          |          |          |          |          |          |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|----------|----------|----------|----------|----------|----------|----|
| 配分項目<br>Items                                                                                                                                         | 配分比例<br>Percentage | 多元評量方式 Assessments |          |          |          |          |          |          |    |
|                                                                                                                                                       |                    | 測驗<br>會考           | 實作<br>觀察 | 口頭<br>發表 | 專題<br>研究 | 創作<br>展演 | 卷宗<br>評量 | 證照<br>檢定 | 其他 |
| 平時成績(含出缺席)<br>General Performance<br>(Attendance Record)                                                                                              | 10%                |                    | ✓        |          |          |          |          |          |    |
| 期中考成績 Midterm Exam                                                                                                                                    | 60%                | ✓                  |          |          |          |          |          |          |    |
| 期末考成績 Final Exam                                                                                                                                      | 30%                | ✓                  |          |          |          |          |          |          |    |
| 作業成績 Homework and/or<br>Assignments                                                                                                                   |                    |                    |          |          |          |          |          |          |    |
| 其他 Miscellaneous<br>(_____)                                                                                                                           |                    |                    |          |          |          |          |          |          |    |
| 評量方式補充說明<br>Grading & Assessments Supplemental instructions                                                                                           |                    |                    |          |          |          |          |          |          |    |
|                                                                                                                                                       |                    |                    |          |          |          |          |          |          |    |
| 教科書與參考書目(書名、作者、書局、代理商、說明)<br>Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)                                            |                    |                    |          |          |          |          |          |          |    |
| Larson/Calculus: An Applied Approach (Metric Edition) / 10e                                                                                           |                    |                    |          |          |          |          |          |          |    |
| 課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)<br>Teaching Aids & Teacher's Website(Including online teaching information.<br>Personal website can be listed here.) |                    |                    |          |          |          |          |          |          |    |
|                                                                                                                                                       |                    |                    |          |          |          |          |          |          |    |
| 其他補充說明 (Supplemental instructions)                                                                                                                    |                    |                    |          |          |          |          |          |          |    |
|                                                                                                                                                       |                    |                    |          |          |          |          |          |          |    |