



## 教學計劃表 Syllabus

|   |  |                             |                                 |                                    |   |
|---|--|-----------------------------|---------------------------------|------------------------------------|---|
| 課程名稱(中文)<br>Course Name in Chinese  | 代數導論   |                             | 學年/學期<br>Academic Year/Semester | 112/1                              |   |
| 課程名稱(英文)<br>Course Name in English  | Introduction to Algebra  |                             |                                 |                                    |   |
| 科目代碼<br>Course Code   | AM_75120   | 系級<br>Department & Year     | 博士                              | 開課單位<br>Course-Offering Department | 應用數學系   |
| 修別<br>Type  | 選修 Elective  | 學分數/時間<br>Credit(s)/Hour(s) | 3.0/3.0                         |                                    |   |
| 授課教師<br>Instructor  | /王立中   |                             |                                 |                                    |   |
| 先修課程<br>Prerequisite  |  |                             |                                 |                                    |   |
| 課程描述 Course Description   |  |                             |                                 |                                    |   |
| This course is an introduction to abstract algebra. It is a one-year course introducing basics of groups, rings and fields. The aim of this course is to teach students as much about groups, rings and fields as possible. |  |                             |                                 |                                    |   |
| 課程目標 Course Objectives  |  |                             |                                 |                                    |   |
| 本課程主要目標以為高等代數課程或是相關課程之基礎。<br>Provide a foundation for higher study of algebra and related courses.  |  |                             |                                 |                                    |   |
| 系專業能力<br>Basic Learning Outcomes  |  |                             |                                 |                                    | 課程目標與系專業能力相關性<br>Correlation between Course Objectives and Dept.'s Education Objectives |
| A   | 具備專業知識及邏輯推理能力。Have well-founded expertise and be capable of logical reasoning.   |                             |                                 |                                    | ●   |
| B   | 具備學習其它學科的能力，以期能邁向跨領域研究。<br>Be able to study other fields of science so as to conduct interdisciplinary research in the future. |                             |                                 |                                    | ○   |
| C   | 具備獨立思考與解決問題的能力。<br>Be capable of independent thinking and have the problem-solving skills.                                     |                             |                                 |                                    | ●   |
| 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   | Groups and Subgroups   |                             |                                 |                                    |   |
| 2   | Groups of Permutations   |                             |                                 |                                    |   |
| 3   | Cosets and Theorem of Lagrange   |                             |                                 |                                    |   |
| 4   | Direct Products and Homomorphisms  |                             |                                 |                                    |   |
| 5   | Factor Groups  |                             |                                 |                                    |   |
| 6   | Isomorphism Theorems   |                             |                                 |                                    |   |
| 7   | Group Actions  |                             |                                 |                                    |   |

|    |                         |  |
|----|-------------------------|--|
| 8  | Sylow Theorems          |  |
| 9  | Sylow Theorems          |  |
| 10 | Rings and Fields        |  |
| 11 | Rings and Fields        |  |
| 12 | Rings of Polynomials    |  |
| 13 | Ideals and Factor Rings |  |
| 14 | Extension Fields        |  |
| 15 | Algebraic Extensions    |  |
| 16 | Geometric Constructions |  |
| 17 | Finite fields           |  |
| 18 | Galois Theorem          |  |

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 General<br>Performance         | 100%               | ✓                  | ✓        | ✓        |          |          | ✓        |          |    |
| 期中考成績 Midterm Exam                  |                    |                    |          |          |          |          |          |          |    |
| 期末考成績 Final Exam                    |                    |                    |          |          |          |          |          |          |    |
| 作業成績 Homework and/or<br>Assignments |                    |                    |          |          |          |          |          |          |    |
| 其他 Miscellaneous<br>(_____)         |                    |                    |          |          |          |          |          |          |    |

評量方式補充說明

Grading & Assessments Supplemental instructions

教科書與參考書目 (書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

A First Course in Abstract Algebra, 7th Edition

John B. Fraleigh (Author)

出版商: Pearson

語言: English

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)

Teaching Aids & Teacher's Website(Including online teaching information.

Personal website can be listed here.)

其他補充說明 (Supplemental instructions)