國立東華大學

課　　綱　Course Outline

應用數學系碩士班

中文課程名稱 Course Name in Chinese	代數專題（一）				
英文課程名稱 Course Name in English	Topics in Algebra (I)				
科目代碼 Course Code	AM__53500	班 別 Degree	碩士班 Master’s		
修別 Type	選修 Elective	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite	無				

課程目標 Course Objectives
研習基本代數結構，以訓練學生處理複雜問題的簡化能力。 To study basic algebraic structures to train the students to have the ability to simplify and reduce complicated problems.

系教育目標 Dept.’s Education Objectives	
1	訓練嚴謹思考與推理能力。 To provide a solid training in rigorous thinking and reasoning ability.
2	奠定理論與應用數學的基礎知識。 To establish well-founded background knowledge in pure and applied mathematics.
3	具備跨領域學習能力。 To prepare the students for interdisciplinary study in the future.

系專業能力 Basic Learning Outcomes		課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.’s Education Objectives
A	具備專業數學知識及邏輯推理能力。 Have well-founded expertise in mathematics 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。 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。 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

課程大綱
Course Outline

1.集合論: 集合與關係, 複形與矩陣代數
Set Theory : sets and relations, complex and matrix algebra

2.群表現: 群作用, 線性表現, 子表現, 不可約表現, 表現的張量積
Group Representations : group actions, linear representations, subrepresentations, irreducible representations, tensor product of representations.

3.交換環: 根理想, 局部化, 諾特環中理想的準素理想分解
Commutative Rings : radicals, localization, primary decomposition of ideals in Noetherian rings.

4.高等線性代數: 喬丹形, 有理形, 主理想環上的模
Advanced Linear Algebra : Jordan forms, rational forms, modules over PID

5.李理論: 可解, 冪零與半單李代數
Lie Theory : solvable, nilpotent and semisimple Lie algebra.

資源需求評估(師資專長之聘任、儀器設備的配合・・・等)
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

由本系專任教師任教

Full time faculty

課程要求和教學方式之建議
Course Requirements and Suggested Teaching Methods

1.課前預習 2.教師講解 3.演練習題 4.學習評量
1. Preview before class 2. Lectures 3. Exercises 4. Exams

其他
Miscellaneous

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