數學系課程核心教材內容

課程名稱：(中文）代數（一） (英文）Algebra (I)				開課單位	學士班
				課程代碼	2102401
學分數	3	必/選修	必修	開課年級	二

教學目標：1、學習近世代數基本知識。
2、學習數學解題及證明能力。

課程概述：群論的基本知識及應用。

先修科目或先備能力：無

建議參考書目	Joseph A. Gallian, Contemporary Abstract Algebra, 6th ed., Houghton Mifflin, Boston, 2006. I. N. Herstein, *Abstract Algebra*, 3rd ed., John Wiley & Sons, New York, 1999.

課程大綱

單元主題	內容綱要	上課週數
Preliminaries	Equivalence relaions and equivalence classes (optional)	2
Group theory	Examples and basic properties of groups. Subgroups	2.5
	Cyclic groups	2.5
	Symmetric groups. Cycle decomposition. Alternating groups. Dihedral groups	3
	Homomorphisms, normal subgroups and quotient groups. Fundamental theorem of group homomorphisms. Three isomorphism theorems	3
	Direct products. Fundamental theorems of finite abelian groups.	1.5
	Group actions and class equations. (optional)	1.5
	p-groups. Cauchy's theorem. Sylow's theorems (without proofs).	2

數學系課程核心教材內容

課程名稱：(中文）代數（二） (英文）Algebra (II)				開課單位	學士班
				課程代碼	2102402
學分數	3	必/選修	必修	開課年級	二

教學目標：1、學習近世代數基本知識。
2、學習數學解題及證明能力。

課程概述：環與體的基本知識

先修科目或先備能力：無

建議參考書目	Joseph A. Gallian, Contemporary Abstract Algebra, 6th ed., Houghton Mifflin, Boston, 2006. I. N. Herstein, *Abstract Algebra*, 3rd ed., John Wiley & Sons, New York, 1999.

課程大綱

單元主題	內容綱要	上課週數
Ring theory	Examples and basic properties of rings.	2
	Ideals and quotient rings. Homomorphisms. Fundamental theorem of ring homomorphisms	3
	Euclidean domains and principal ideal domains. Factorization and UFD’s	4
Field theory	Examples and basic properties of fields. Field extensions	3
	Ruler and compass constructions.(optional)	2
Galois theory	Galois groups, definition and examples. Fundamental theorem of Galois theory. (No proof.)	3
	Finite fields.(optional)	1.5
	Cardan and Ferrari's formulae, insolvability of quintic equations. (optional)	1