

## 〈代數〉資格考範圍

1. Group Theory: Group action, Free groups, direct product and direct sums of groups, Dual groups, Character groups.
2. Ring Theory: commutative rings, Chinese Remainder Theorem, Polynomial rings, Gauss Lemma, UFD, resultant, localization of a ring, local rings, Artinian rings.
3. Module Theory: projective modules, injective modules, tensor product of modules, exact sequences, snake lemmas.
4. Noetherian Rings and Modules: Hilbert's Theorem on Noetherian rings, Nakayama's Lemma, localization of modules, valuation rings, Integral Extensions of rings.
5. Field Theory: Finite Galois Theory, Infinite Galois Theory, Cyclotomic Extensions, Kummer Extensions, Transcendental Extension.

### 參考書目：

1. **Algebra**, 作者：S. Lang
2. **Basic Algebra II**, 作者：N. Jacobson
3. **Algebra**, 作者：T. Hungerford
4. **Introduction to Commutative Algebra**, 作者：M. F. Atiyah and I. G. Macdonald