

به نام خدا

طرح درس سیستم‌های کلی جبر

این درس به طور کلی برای دانشجویان مقطع دکتری ریاضی گرایش جبر طراحی و برنامه ریزی شده است.

فصل‌ها و بخش‌هایی که در این درس ارائه می‌شوند به ترتیب زیر است.

Chapter 1. Free modules, Projective and injective modules

\$ 1. Free modules

1A. Invariant Basis Number (IBN)

1B. Stable Finiteness

1C. The Rank Condition

1D. The Strong Rank Condition

\$ 2. Projective Modules

2A. Basic Definitions and Examples

2B. Dual Basis Lemma and Invertible Modules

2C. Invertible Fractional Ideals

2D. Hereditary and Semihereditary Rings

2E. Hereditary Artinian Rings

2F. Trace Ideals

\$ 3. Injective Modules

3A. Baer's Test for Injectivity

3B. Self-Injective Rings

3C. Injectivity versus Divisibility

3D. Essential Extensions and Injective Hulls

3E. Injectives over Right Noetherian Rings

3F. Indecomposable Injectives and Uniform Modules

3G. Injectives over Some Artinian Rings

3H. Simple Injectives

3I. Maths' Theory

3J. Some Computations of Injective Hulls

3K. Applications to Chain Conditions

Chapter 2. Flat Modules and Homological Dimensions

\$ 4. Flat and Faithfully Flat Modules

4A. Basic Properties and Flatness Tests

4B. Flatness, Torsion-Freeness, and von Neumann Regularity

4C. More Flatness Tests

4D. Finitely Presented (f.p.) Modules

4E. Finitely Generated Flat Modules

4F. Direct Products of Flat Modules

Chapter 3. More Theory of Modules

\$ 5. Uniform Dimensions, Complements, and CS Modules

5A. Basic Definitions and Properties

5B. Complements and Closed Submodules

5C. Exact Sequences and Essential Closures

5D. CS Modules

5E. Finiteness Conditions on Rings

5F. Change of Rings

5G. Quasi-Injective Modules

\$ 6. Singular Submodules and Nonsingular Rings

6A. Basic Definitions and Examples

6B. Nilpotency of the Right Singular Ideal

6C. Goldie Closures and the Reduced Rank

6D. Baer Rings and Rickart Rings

\$ 7. Dense Submodules and Rational Hulls

7A. Basic Definitions and Examples

7B. Rational Hull of a Module

7C. Right Kasch Rings

Chapter 4. Rings of Quotients

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Classical Rings of Quotients

Ore Localizations

Right Ore Rings and Domains

Right Goldie Rings and Goldie's Theorems

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Right Orders in Semisimple Rings