ROWAN UNIVERSITY
Department of Mathematics

Syllabus
Math 01.341 - Modern Algebra II

CATALOG DESCRIPTION:

Math 01.341 Modern Algebra II, 3 s.h

Prerequisite: Math 01.340 Modern Algebra I with a grade of C- or better

This course extends the study begun in Modern Algebra I to a more detailed investigation of abstract algebraic structures. Included are Sylow theorems, rings and ideals, polynomial rings, ring and field extension and Galois Theory.

CONTENT:

1. **Group Theory**

    1.1 Normal subgroup
    1.2 Fundamental Theorem of Groups (Quotient Group)
    1.3 Group isomorphism theorems
    1.4 Cauchy's Theorem for abelian groups
    1.5 Group automorphisms
    1.6 Cayley's Theorem
    1.7 Permutation groups
    1.8 Sylow Theorems

2. **Ring Theory**

    2.1 Ideal and prime ideals
    2.2 Euclidean rings and principle ideal rings
    2.3 Polynomials and zeros of a polynomial
    2.4 Polynomial factorization theorem
    2.5 Irreducibility criteria
    2.6 Symmetric functions

3. **Theory of Fields**

    3.1 Subfields and prime fields
    3.2 Field adjunction
    3.3 Simple field extensions
    3.4 Linear dependence over a skew field
    3.5 Linear equations over a skew field

TEXTS:

Joseph Gallian, CONTEMPORARY ABSTRACT ALGEBRA, 6th ed, Houghton Mifflin

Rotman, J.J., A FIRST COURSE IN ABSTRACT ALGEBRA, 2nd ed, Prentice Hall, 2000

Pinter, C.C., A BOOK OF ABSTRACT ALGEBRA, 2nd ed, Dover, 1990

Herstein, I.N., TOPICS IN ALGEBRA, 2nd ed., Xerox, Mass., 1975

Reviewed: 04/2021