

**Module Syllabus:**

Course Title: Abstract Algebra 2  
 Course Code: 250442  
 Semester: Second 2011/2012  
 Lecturer : Amin Witno  
 Office Room: 820 (Ext. 2228)  
 Office Hours: Sunday – Thursday 12–1  
 E-mail: awitno@gmail.com

**Short Description:**

This module is the second half of the undergraduate Abstract Algebra series, covering topics in rings and fields: integral domains, polynomial rings, field extensions, finite fields, and a brief coverage of Galois theory, time permitting.

**Topics by the Week:**

Week	Topics
1	Review of Group Theory
2	Introduction to rings and subrings, basic properties
3	Integral domains, fields, unit elements
4	Ideal, principal ideal domains
5	Factor rings, properties of a ring homomorphism
6	The fundamental homomorphism theorem for rings, Chinese remainder theorem
7	Polynomial rings, the division algorithm for rings
8	Irreducible polynomials, unique factorization of polynomials over fields
9	Extension fields, algebraic elements
10	Splitting fields, properties of finite fields
11	Algebraic extension, simple extensions
12	Some irreducibility tests over $\mathbb{Q}$
13	Introduction to cyclotomic fields
14	Geometric constructions, constructable numbers, regular polygons
15	Selected topics in number fields, applications of finite fields, or an introduction to Galois theory
16	Final Exam will be held in this period

### **Grade Distribution:**

- Exam 1      14/03/2012    20%
- Exam 2      23/04/2012    20%
- Quizzes      TBA            10%
- Homework    Weekly        10%
- Final Exam   June 2012    40%

### **Course Notes:**

- Amin Witno, [From Groups to Galois](http://www.philadelphia.edu.jo/math/witno/notes.htm)---these notes are required and available for free download from <http://www.philadelphia.edu.jo/math/witno/notes.htm>

### **References:**

- Joseph A. Gallian, Contemporary Abstract Algebra, Seventh Edition 2010, Brooks/Cole.
- John R. Durbin, Modern Algebra: An Introduction, Sixth Edition 2009, Wiley.
- I. N. Herstein, Topics in Algebra, Second Edition 1975, Wiley.

### **Online Resources:**

- Basic Sciences Department: <http://www.philadelphia.edu.jo/math>
- Amin Witno Website:        <http://phi.witno.com>

AW120122