Course Information

Course Number:	*Math 3360*
Course Name:	Introduction to Fields and Rings
CRN:	20367
Location:	MCS 212
Class Hours:	9:25am-10:40am T Th
Textbook:	A First Course in Abstract Algebra by Anderson and Feil. 2nd edition
Prerequisites:	2335

Instructor Information

Name:	Dr. Jeffrey Beyerl
Office Location:	MCS 237
E-mail:	jbeyerl@uca.edu
Phone:	501-450-5652

Office Hours:

Monday	11:00-11:50
Tuesday	10:50-11:55
Wednesday	11:00-11:50*
Thursday	10:50-11:55
Friday	11:00-11:50

*The office hours on Wednesday are in the MRC

Course Description

A required course for majors in pure mathematics, UCA STEMteach Pure Mathematics, and UCA STEMteach Mathematics Education tracks. This course is designed to introduce students to abstract mathematics. Topics include binary operations, the integers, modular number systems, rings, and fields

Course Objectives and Requirements

The primary objective in this course is to develop the theory of fields and rings.

Grading Policy

- Your grade will be computed from tests, a final exam, and other items as deemed appropriate. The other items will be determined as the semester progresses.
- Tests will be administered approximately halfway into the semester, and toward the end of the semester.
- Make-up tests will only be given for official university events or personal emergencies. In the former case the test must be taken before official test date, in the latter case a short letter explaining why you missed the test, why this justifies a make-up, and supporting documentation must be turned in before the day you're able to return to class. In the event that a make-up is justified, it must be taken before you are able to return to class. At his discretion, the instructor may choose to administer a make-up test or use the final exam to replace the make-up.
- Borderline grades will be determined based on the final exam and effective participation throughout the course.
- All assignments that are turned in must be typed and printed. Because of the need for mathematical symbols and structure, LaTeX or Microsoft Word (2007+) are recommended. Late work may be submitted before the assignment is discussed during class: it should be compiled into a PDF and sent via e-mail; the penalty rate is 0.2% per hour.

Test 1	15%
Test 2	15%
Final Exam	30%
Homework & Other Items	40%

Student Learning Objectives

- Be able to describe the minimal information on a set to guarantee the ability to solve equations in that set.
- Be able to extend a number system to a larger one so as to solve an equation previously unsolvable in the original system.
- Be able to explain in a general setting the standard rules of arithmetic.
- Run the Euclidean algorithm in the polynomial ring setting.

Tentative Course Outline

(We may cover other material too and/or skip the latter chapters listed here)

Chapter 1	The Natural Numbers Review – read it on your own
Chapter 2	The Integers Quick pace
Chapter 3	$\mathbb{Z}_n$
Chapter 4	$\mathbb{Q}[x]$
Chapter 5	Factoring Polynomials Quick pace
Chapter 6	Rings
Chapter 7	Subrings and Identity
Chapter 8	Integral domains and fields Slow pace
Chapter 9	$\mathbb{F}[x]$
Chapter 10	Units, Associates, and Irreducibles Quick pace
Chapter 11	Ideals
Chapter 12	PIDs Quick pace
Chapter 13	UFDs Quick pace
Chapter 14	$\mathbb{Z}[x]$
Chapter 15	EDs Quick pace
Chapter 16	Ring Homomorphisms
Chapter 17	The Kernel of a Homomorphism
Chapter 18	Rings of Cosets
Chapter 19	The Isomorphism Theorem
Chapter 20	Maximal and Prime ideals
Chapter 21	CRT

Important Dates

Last day to Drop Drop means the course is not on your record	August 26th
Test 1	October 22nd
Last day to Withdraw Withdraw means the course is on your record with a "W" but does not factor into your GPA	October 30th
Test 2	November 19th, 24th, or December 1st If the class self-organizes and unanimously chooses which day, it will be that day. Otherwise the instructor will choose a day.
Last day for WF/WP WF means withdraw failing and is factored into your GPA as an "F" WP means withdraw passing and is not factored into your GPA WF/WP will be decided by whether or not your current grade is above or below 60%. Please see me to verify your grade before withdrawing with a WF/WP.	November 30th
Final Exam	Tuesday December 8th 8am-10am

Outside of class resources

- The Textbook
    - Description of material
    - Example problems
    - Exercise problems
- Blackboard
    - Quiz/test solutions
    - Notes from class
- Office Hours
    - Individual help
- The Math Resource Lab
    - Study Area
- A note on working together and using the internet: it is very important to develop intuition. Short circuiting the thinking process undermines your ability to learn. As such, the use of the internet to find complete proofs is discouraged. Working with other students in the class is highly encouraged, as long as you use appropriate peer study techniques:
    - Always think about a problem individually before discussing it together
    - Make sure you're on the same page by discussing the definitions and what the objects you're playing with are.
- A note on asking and giving assistance: as above to avoid short-circuiting your own education or somebody else's, you should never ask for or give a complete solution or key insight. Asking for or giving hints, however, is acceptable.

Attendance Policy

Your active participation in this course is expected and required for you to learn the material and earn a passing grade. If you fail to regularly and actively participate it will demonstrate that you are not making a reasonable effort to complete this course, and you will be administratively dropped for non-attendance with a grade of WF.

***Punctuality: Class starts at 9:25am. Please be ready to learn when class starts.

Academic Integrity Statement

The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the Student Handbook. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

Americans with Disabilities Act Statement

The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation under this Act due to a disability, please contact the UCA Office of Disability Services, 450-3613.

Sexual Harassment and Academic Policies Statement

All students are required to familiarize themselves with the University of Central Arkansas policy on sexual harassment and on academic policies. These policies are printed in the Student Handbook.

Building Emergency Plan Statement

An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS documents for most buildings on campus are available at http://uca.edu/mysafety/bep/. Every student should be familiar with emergency procedures for any campus building in which he/she spends time for classes or other purposes.