

*Course Information*

<b>Course Number:</b>	Math 3360
<b>Course Name:</b>	Introduction to Fields and Rings
<b>CRN:</b>	20367
<b>Location:</b>	MCS 212
<b>Class Hours:</b>	9:00am-9:50am MWF
<b>Textbook:</b>	A First Course in Abstract Algebra by Anderson and Feil, 3 <sup>rd</sup> edition
<b>Prerequisites:</b>	Math 2335

*Instructor Information*

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

**Office Hours:**

Monday	10:00am
Tuesday	10:00am
Wednesday	10:00am*
Thursday	10:00am

\*The office hours on Wednesday are in the MRC

**Question:** Can I only come during office hours?

**Answer:** You can come anytime! I am typically in my office from 8am until 4pm; office hours are merely designated times that I avoid scheduling meetings or running errands.

**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, homework, quizzes, and a final exam.
- 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 penalties are as follows: 0.15% per hour late; 3% if emailed as a PDF; 10% if not a PDF; 50% if already discussed in class.

Test 1	15%
Test 2	15%
Test 3	15%
Final Exam	25%
Homework	20%
Quizzes	10%

## 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)

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

## Important Dates

Last day to Drop Drop means the course is not on your record	August 24 <sup>th</sup>
Test 1	Around the time we finish polynomials.
Last day to Withdraw Withdraw means the course is on your record with a "W" but does not factor into your GPA	October 28 <sup>th</sup>
Test 2	Around the time we finish ideals.
Test 3	Near the end of the semester. Maybe take home.
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 28 <sup>th</sup>
Final Exam	Wednesday December 7 <sup>th</sup> 2pm-4pm

## 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.
- Previous course materials: All tests and quizzes I've given in previous meetings of this course are available online: <http://faculty.uca.edu/jbeyerl/courses.html>.

**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.

**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.