

MAT 442 Abstract Algebra
Course Syllabus
Siena Heights University
Fall 2013

Instructor:	Jeff Kallenbach
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Hrs:	Whenever I am not in class. MWF 2:00 will be devoted to this class
Course Meets:	MWF 3:00
Prerequisites:	MAT260 (Discrete) and MAT345 (Linear) or equivalent
Text:	<i>Abstract Algebra Theory and Applications</i> , Judson
Software:	We will make use of GAP algebra program and Maple as applicable
Handheld:	A TI-NSpire will be the handheld model of choice
Course Management:	Engrade will be the host for this course

Course Objectives We will be covering the topics required for state certification to teach mathematics as indicated by Michigan Department of Education. In addition we will correlate Modern (Abstract) Algebra to the HS algebra classroom.

Topics Covered include

- Functions and Sets
- Basic Number Theory
- Group Theory - Introduction to Groups, familiar groups, subgroups, homomorphism, isomorphism, cyclic groups, permutation groups.
- Modular Arithmetic; The Rings Z_m
- Polynomials
- Fields

Method of Evaluation for MAT442

Presentations and written assignments will determine the course grade. In studying mathematics, **students are encouraged to work in groups in order to achieve comprehensive understanding.** However, work submitted for credit should be the creation of the student.

Grading Scale		Grade Apportionment	
87.5%+	A	Collected Homework	25%
75-86.9%	B	Homework Quizzes	20%
62.5-74.9%	C	Hour Exams (3)	50%
50-62.9%	D	Presentations	5%
Less than 50%	E		

The instructor reserves the right to make changes without notice as needed.

Homework

Homework problems will be assigned for each section, from the text and worksheets. Some problems will be collected and graded, counting as shown above. The others will be for practice, and form the basis for the exams and the Homework Quizzes.

Homework Quizzes

2-3 times per week, in class, we will have a brief Homework Quiz, consisting primarily of uncollected homework problems.

Presentations

Approximately twice during the course you will be required to present a brief lesson to the class. This will probably consist of a proof of one of the key theorems that is in the book. It will be graded using a rubric that will be made available on the course web site.

Exams

There will be three hour exams, the last of which will be during our Final Exam period in-class. The exams will not be comprehensive per se, but the material in this course is cumulative.

Proofs

One of the primary objectives of this class is to learn to write and understand proofs. Beginning with logical premises and simple proofs about sets, we will progress through increasingly intricate proofs. Proficiency and comfort with proof writing will progress as you work on them, as the course progresses.

Detailed Course Description

The content of this course will cover most of chapters 1-7, 9-12, 16, 17, 21, and 22 in the text, in order. Besides relearning/brushing up on the mathematics, we will discuss mathematical reasoning and thinking, and techniques. This subject does not lend itself to technology as much as some others, but some use can be made of the programs that are available, and we will spend time discussing how to relate our work to the HS classroom. A great deal of work will be required outside of class. Much of our time in class will be spent discussing the difficulties you encountered while attempting the problems yourselves.

Methods of Instruction

- A variety of methodologies will be employed.
 - **Reading the text book** – You have gotten to the point in math training that you can get something useful from the text. The explanations in there are good, if a little bit brief. But you should be able to use the text to fill in holes in the classroom discussion.
 - **Working examples** – You will be expected to keep up with the assigned homework and do additional problems if you feel you need more practice. You should keep a notebook of worked examples and written homework assignments, and read through them periodically to keep the material fresh.
 - **Technology Activities** – We will use Maple, GAP, and the nSpire when possible to help with explanations. In addition, we will visit useful web sites as needed.

Up Next

- If you like this material and need an elective, a follow-up independent study course will be offered next semester, basically covering the rest of the text.

Mission Statement of Siena Heights University

The mission of Siena Heights, a Catholic university founded and sponsored by the Adrian Dominican Sisters, is to assist people to become more competent, purposeful and ethical through a teaching and learning environment which respects the dignity of all.

Learning Outcomes

The **Mathematics Department** has identified the following four learning outcomes to be achieved by majors and minors in its program.

1. Students will read and understand mathematics, differentiating between correct and incorrect mathematical reasoning.
2. Students will effectively communicate mathematics, both in writing and speaking.
3. Students will demonstrate abilities to work independently and in-groups to develop mathematical models using appropriate technologies.
4. Students will demonstrate a mathematical maturity leading to independent investigations, increased responsibility for learning, and participation in the professional mathematics community.

Academic Honesty:

The search for truth and dissemination of knowledge are the central missions of a university. Siena Heights University pursues these missions in an environment guided by our Roman Catholic tradition and our Dominican heritage. Integrity and honesty are therefore expected of all members of the University community, including students, faculty members, administration, and staff. Actions such as cheating, plagiarism, collusion, fabrication, forgery, falsification, destruction, multiple submission, solicitation, and misrepresentation, are violations of these expectations and constitute unacceptable behavior in the University community. The penalties for such actions range from verbal warning, all the way to expulsion from the University.

Students are responsible for their own work and accomplishments. You are encouraged to discuss problems with others, but the actual written work submitted should be your own. The first occurrence of cheating on any assignment will result in a grade of zero on that assignment. The second time the same student is observed cheating will result in that student being given an E for the course. All cases of academic dishonesty will be documented and reported to the appropriate authorities on campus. For a complete explanation of the Academic Dishonesty Policy, refer to the most recent SHU Undergraduate Catalog.

Students With Disabilities

Section 504 of the rehabilitation act of 1973 and the Americans With Disabilities Act of 1990 require that the institutions such as SHU not discriminate against qualified students with disabilities and that effective and reasonable academic accommodations be provided for eligible students. In accordance with University policy and the equal access laws, I am available to discuss appropriate academic accommodations that you may be eligible for as a student with a disability. Please contact me for an appointment to discuss possible accommodations. Students must register with the Office for Students with Disabilities for disability verification and determination of reasonable accommodations.

Classroom Emergency Preparedness and Response Information

To Report an Emergency or Suspicious Activity

Call the Department of Public Safety at 517-264-7800 (Adrian Campus). If the line is unavailable or you are calling from another University location, dial 911.

Shelter in Place – General Guidance

Although it is unlikely that we will ever need to shelter in place, it is helpful to know what to do just in case. No matter where you are on campus, the basic steps of shelter in place will generally remain the same:

- If you are inside, stay where you are. If you are outdoors, proceed into the closest building or follow instructions from emergency personnel on scene.
- Shelter-in-place in an interior room, above ground level, and with the fewest windows. If sheltering in a room with windows, keep away from the windows. If there is a large group of people inside a particular building, several rooms maybe necessary.
- Shut and lock all windows (locking will form a tighter seal) and close exterior doors.
- Turn off air conditioners, heaters, and fans. Close vents to ventilation systems as you are able. (Facilities staff will turn off ventilation systems as quickly as possible).
- Make a list of the people with you and call the list in to Public Safety so they know where you are sheltering.
- Visit Campus Safety @ Siena for incident updates <http://www.sienaheights.edu/campussafety.aspx> or call the Information Line 517-264-7900. If possible, turn on a radio or television and listen for further instructions. If your e-mail address or mobile device is registered with SHU Alerts, check for alert notifications.
- Make yourself comfortable and look after one other. You will get word as soon as it is safe to come out.

Evacuation

An evacuation will be considered if the building we are in is affected or we must move to a location of greater safety. We will always evacuate if the fire alarm sounds. In the event of an evacuation, please gather your personal belongings quickly (purse, keys, cell phone, SHU ID card, etc.) and proceed to the nearest exit. ***Ground Floor – Exit doors next to SCI 45; 1st Floor – Exit doors next to SCI 131.*** Do not use the elevator. ****A second way out of the building for both floors - note the exit door by science 40 and the one upstairs on the east end.***

Once we have evacuated the building, proceed to our primary rendezvous location ***Enter Studio Angelico, if needed.*** In the event that this location is unavailable, we will meet at ***Performing Arts Theater.***

SHU Alerts

SHU Alerts provides free notification by e-mail or text message during an emergency. Visit Campus Safety @ Siena for a link and instructions on how to sign up for alerts pertaining to your campus. If you receive a SHU Alert notification during class, please share the information immediately.

Additional Information

Additional information about emergency preparedness and response at SHU as well as the University's operating status can be found on Campus Safety @ Siena website <http://www.sienaheights.edu/campussafety.aspx> or by calling the Department of Public Safety at 517-263-0731.