

MATH 5342: Concept and Techniques in Algebra
Fall 2014

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Office Hours: Monday, 4:15pm – 5:15pm or by appointment.

Section Information: MATH 5342 - 001

Time and Place of Class Meetings: PKH 305, Monday, 5:30 pm – 8:20 pm

Description of Course Content: This course will explore the various definitions of algebra in K-12 that have been put forth in the literature. This includes algebra as the study of functions and function relationships, algebra as the study of multiple representations with an emphasis on graphs, tables, and formulae, algebra as generalized arithmetic and quantitative reasoning, algebra as a language, and algebra as a formal mathematical system. This course will engage the students in using algebra to represent and analyze mathematical situations and will emphasize students' conceptual understanding of the ideas central to algebra. In addition to providing mathematical content background for middle and secondary school teachers, this course will address strategies for implementing an instructional approach that emphasizes algebraic thinking.

Student Learning Outcomes: Upon successful completion of this course, you will be able to:

1. Apply algebra problem-solving skills to problem situations.
2. Explain and justify algebraic ideas verbally and in writing.
3. Examine your beliefs regarding the goals and content of algebra in secondary school.
4. Describe and critique different approaches to teaching algebra in secondary school.
5. Evaluate instructional activities for algebra according to their mathematical and pedagogical features.

Required Textbooks and Other Course Materials:

- **Text:** We will use the following text for homework problems and some readings. You may also use this text in other courses in the M.A. program. You do not need to bring the textbook to class.

Usiskin, Z., Peressini, A., Marchisotto, E. A., & Stanley, D. (2003). *Mathematics for high school teachers: An advanced perspective*. Upper Saddle River, NJ: Pearson Education, Inc.

- **Journal Articles:** You will be expected to use the university library databases and obtain copies of the journal articles we will use in this course. (Reading assignments will be given throughout the semester.) The library can offer assistance in finding these articles. Please visit <http://www.uta.edu/library>
- **Other required materials:**
Graphing calculator (e.g., TI-83 Plus, TI-84, etc.)
Grid paper
- **Additional materials:** Some materials will be made available on the blackboard site for this course

Course Assignments:

1. Problem situations. Throughout the semester, you will be assigned challenging problems. You will discuss these problems in class with a group of your peers, and then you will turn in written solutions to these problems. With advance notice, your group may be asked to give short presentations and lead discussions on your problems and solutions during class. Written solutions will be graded on mathematical correctness (50%) and the accuracy and clarity of your explanations and justifications (50%).
2. Reading assignments. Reading assignments will be given throughout the semester, and you will write a 2-3 page reactive summary for each of the articles assigned. After class discussion of the articles, you may be asked to complete a short quiz on the readings. You will be allowed to use your 2-3 page summaries to complete the quiz. Written summaries will be graded on the thoroughness of your summary (50%) and the depth of your reaction/ response to the article (50%).
3. Course Project. Design and complete a teaching experiment on any algebraic reasoning topic. More details will be provided by the fourth week of the semester. I must approve this project.

Course Grades:

Problem situations (6)	30%
Reading assignments (6)	30%
Attendance and class participation	10%
<u>Project</u>	<u>30%</u>
Total	100%

Professionalism: You are expected to actively participate in and stay on task during classroom activities and discussions. You are encouraged to offer suggestions and conjectures even if you aren't sure of the answers. In addition, you are expected to work with others, respect others' ideas, and celebrate others' successes. Final course grades will be lowered for a lack of or inappropriate participation.

Attendance: At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I have established the following attendance policy:

Because this course relies heavily on group participation and meets only once per week, more than one absence from our weekly class or excessive tardiness will lower your final grade.

Course Schedule

Date	Topic(s)	Assignments Due
August 25	Introduction to the course Student difficulties in working with symbols	
September 1	NO CLASS: Labor Day	
September 8	Student difficulties in working with symbols	Summaries for Reading List 1
September 15	Approaches to algebra	Solutions to Problem Set 1
September 22	Approaches to algebra	Summaries for Reading List 2
September 29	Real numbers and complex numbers	Solutions to Problem Set 2
October 6	Real numbers and complex numbers	Summaries for Reading List 3
October 13	Functions	Solutions to Problem Set 3
October 20	Functions	Summaries for Reading List 4
October 27	Functions	Solutions to Problem Set 4
November 3	Functions	Summaries for Reading List 5
November 10	Equations	Solutions to Problem Set 5
November 17	Equations	Summaries for Reading List 6
November 24	Equations	Solutions to Problem Set 6
December 1	Equations	
December 8	Final project presentations	Final project due

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Kathryn E. Rhoads

Additional Information

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Title IX: The University of Texas at Arlington is committed to upholding U.S. Federal Law "Title IX" such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit www.uta.edu/titleIX.

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as “lecture,” “seminar,” or “laboratory” shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. As you leave the classroom, turn right and exit down the stairs at the end of the hall. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

<p>Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911.</p>
