MTE 597 – Algebraic Structures for Teachers
Spring 2013

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Texts: *Principles and Standards for School Mathematics*, NCTM; *Fostering Algebraic Thinking* by Mark Driscoll; *Thinking Mathematically* by Carpenter, Franke, and Levi; *Young Mathematicians at Work: Constructing Algebra* by Fosnot and Jacob.

Course Description and Goals: The objectives of this course are to 1) identify algebraic ideas at all levels of the curriculum and foster their learning by students, 2) understand, use, and analyze appropriate representations of algebraic concepts, 3) develop algebraic habits of mind and ways of fostering these habits in students; 4) develop appropriate ways to assess understanding of algebraic reasoning and functions, and 5) incorporate the judicious use of technology to solve problems and present solutions.

Student Learning Outcomes: At the end of the semester, the successful student will be able to demonstrate 1) knowledge of mathematical functions including linear, quadratic, and exponential functions, 2) an understanding of the mathematical modeling process and the underlying problem solving strategies, 3) the ability to describe and communicate mathematical ideas, 4) the ability to understand and analyze the mathematical thinking of others.

Instruction: This course will study algebraic reasoning and functions by 1) reading articles, case studies, books before class, 2) discussing what research has to say about the learning of algebraic reasoning and functions, 3) working on challenging problems to develop our own mathematical abilities, 4) examining and assessing student thinking.

Attendance & Participation: There is no "official" attendance policy for this class; however, I do expect you to be present and to actively participate in each class session in order to gain understanding of the mathematical concepts that you will be expected to teach in an elementary setting. **You must be in class when it BEGINS in order to participate in a given class session!!** It has been my experience that you will not master the material without regular punctual class attendance. Attendance will be taken every class period.

Grades: Your grade for this course will be determined by five elements, each of which has equal weight: 1) journal entries and participation; 2) a written student interview; 3) a short case study; 4) a paper detailing your own mathematical work; 5) a lesson involving a problem you select to develop algebraic thinking in your students; and 6) article reviews from current research. More information will be given on each of these assignments.

Student Success: Your success in the course is entirely dependent on you. I will present the material using instructional strategies supported by recent research in mathematics education, however, the learning of such material is **YOUR** responsibility. You are expected to come to class ready and willing to learn, to be prepared for every class, and to participate

fully in every class. This is not the kind of course where you can just sit back and listen and take a few notes. It is important that you be engaged in discussions, ask questions, and be actively involved in all activities in order to fully benefit from the course and indeed be successful in it.

Student Conduct: Students are expected to conduct themselves in a professional manner at all times. Classroom disruptions will **not** be tolerated. Classroom disruptions include (but are not limited to): coming to class late, leaving class early, talking off-topic, incessant chatting, and using electronic communication devices. Any student who disrupts a class session will immediately be asked to leave the classroom. Students who repeatedly disrupt class will be dropped from the course. No exceptions!! "All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (Student's Guide Handbook, Policies and Procedures, Conduct.)

Getting help: If you need help in the course, the first step should be talking with the instructor. The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact: Office of Student Disability Resources and Services, Gee Library, Room 132. Phone (903) 886-5150 or (903) 886-5835; Fax (903) 468-8148.

Academic Dishonesty: Texas A&M University-Commerce has explicit rules and regulations governing academic dishonesty and academic misconduct. These policies are stated in detail in the Student's Guide Handbook. Each student is expected to read this document and abide by the contained policies. These university policies will be followed in this class. The minimum penalty for an act of academic dishonesty will be the assignment of a grade of 0 on the examination or homework assignment.

Working with another person or in study groups on problems can be helpful in learning the material. I encourage you to work together if you find it helpful. However, **all written work submitted must be your own**. Copying someone else's problem solution or showing your written solution to someone else is prohibited. In order to be successful in learning the material and doing well on the examinations you must think very hard about the problems themselves **before** discussing them with anyone else.

Remaining enrolled in this course constitutes acceptance of all policies contained in this syllabus.

Any changes in this syllabus will be communicated to you in class by the instructor.

Tentative due dates:
Article Reviews: Jan 31
Interview: Feb 21
Case Study: March 28
Lesson Paper (draft): April 11
Lesson Paper (final): May 2