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| Course title and number    | Structure of Mathematics I (MATH 365)   |
| Term                       | Fall 2017   |
| Meeting times and location | Section 501 meets TR from 8:00 to 9:15 AM in BLOC 117<br>Section 502 meets TR from 9:35 to 10:50 AM in BLOC 117 |

### Course Description and Prerequisites

*Structure of Mathematics I.* (3-0). Credit 3. Informal logic, sets, relations, functions, whole numbers, numeration systems, binary operations, integers, elementary number theory, modular systems, rational numbers and the system of real numbers. Designed primarily for elementary teacher certification. Others must have consent of instructor. *Prerequisites:* Must have completed University Core Curriculum mathematics requirements with a grade of C or better.

### Course Objectives and Learning Outcomes

The purpose of taking the MATH 36X series of courses (MATH 365, 366, and 367) is for preservice elementary and middle school teachers to:

- Acquire knowledge of the mathematics topics beyond elementary school mathematics that can aid in developing deeper knowledge of elementary school mathematics;
- Gain experience in using this deeper understanding of the content to answer EC-8 students' math questions (at both a conceptual and procedural level), interpret EC-8 students' possible confusion about the math, and trouble-shoot EC-8 students' possible mistakes;
- Develop the disposition and ability to look at a problem from different points of view;
- See connections between different topics and branches of mathematics;
- Acquire knowledge of where to find potential material for enrichment for more advanced elementary students.

The overall goal of MATH 365 is to provide preservice elementary and middle-school teachers with the mathematical knowledge necessary to provide effective classroom instruction related to numbers and operations. MATH 365 is a mathematics CONTENT course for students working toward a teaching certificate that allows them to teach mathematics from Early Childhood through Grade 8. It IS NOT a methods course in which the main focus is on how to TEACH mathematics. It IS a course in which you will be asked to DO AND LEARN mathematics by engaging in logical mathematical thinking about numerical concepts so that you will have a strong content-knowledge base from which you can draw to make appropriate instructional decisions and generate appropriate mathematical questions as a mathematics teacher in elementary or middle school.

Students who participate in this course should improve their ability to:

- Appropriately represent in multiple ways the content related to numbers and operations that they are expected to teach;
- Develop and explain (verbally, pictorially, and in writing) their own mathematical thinking about numbers and operations;
- Use logical reasoning in the context of numbers and operations, including making conjectures and justifying them or providing counterexamples to disprove them; and
- Analyze and evaluate the mathematical reasoning of others.

The development of these broad outcomes will be supported by the accomplishment of more specific outcomes that will be articulated during the course.

During the semester, you will be expected to do homework that has been assigned to promote class discussion. There will be frequent in-class discussions of concepts and language that you will see again on the exams. It is impossible to replicate these experiences outside of the classroom environment; therefore class attendance and participation are extremely important and will be counted toward your daily grade. **Attendance is required and will be taken each class period.**

In addition, you are encouraged to schedule some time to work with other classmates outside of class. The majority of the content of this course focuses on the vocabulary and language of mathematical reasoning. The best way to learn vocabulary and language is to **use** it! In previous semesters, students in this course have found it very helpful to form small study groups, or at least to have a study partner, with which to discuss the ideas and homework problems. Office hours (or times you schedule by appointment) are also available for extra discussion and questions.

### Instructor Information

Name Tamara Carter, Instructional Assistant Professor  
 Phone The department's phone number is 979-845-3261.  
 There is no phone in my office, so email is a better way to reach me.  
 Email Address tcarter@tamu.edu (please include your full name, class, and section in all emails)  
 Office Hours TR 11:00 – noon in Blocker 246, TR 1:00 – 2:00 in Blocker 245A, and by appointment in Blocker 245A.  
 Office Location Blocker 245A  
 Webpage www.math.tamu.edu/~tcarter Class material will be posted in eCampus (eCampus.tamu.edu)

### Required Materials

- Billstein, R., Libeskind, S., & Lott, J. A Problem Solving Approach to Mathematics for Elementary School Teachers (Eleventh Edition). (This textbook will also be used in Math 366 if you take it here next semester.) Notice that this is NOT the newest edition.
- *Texas Essential Knowledge and Skills for Mathematics* (revised)  
 Available here: <http://ritter.tea.state.tx.us/rules/tac/chapter1111/index.html>
- *Texas A&M Student ID* - Bring your student ID to all exams. If you have a question about your grade, please come see me in person and bring your ID.
- *Calculator* - A calculator is not required. However, a five-function or scientific calculator is allowed. Programmable calculators (such as TI83/84/89/inspire), cell phones, tablets, and computers are NOT allowed on exams.

### Tentative Course Topics and Calendar of Activities

All changes will be announced in class, via email, or posted in eCampus. My expectation is that you have read the book sections and completed associated daily assignments before coming to class.

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|---|-----------------|---|-----------------------------|
| Week 1  | Aug. 29, 31     | Introduction, 1.3, 2.1  |                             |
| Week 2  | Sept. 5, 7      | Sections 2.1-2.3  |                             |
| Week 3  | Sept. 12, 14    | Sections 3.1-3.2, Parts of Sections 3.3-3.4                                 |                             |
| Week 4  | Sept. 19, 21    | Continue Parts of Sections 3.3-3.4, Section 3.5                             |                             |
| Week 5  | Sept. 26, 28    | Finish Exam 1 material and Review   | <b>Exam 1 Sept. 28</b>      |
| Week 6  | Oct. 3, 5       | Sections 4.1, 4.2, 4.3  |                             |
| Week 7  | Oct. 10, 12     | <b>Group Explanation 1</b> due MONDAY by 8 am in eCampus; Sections 5.1, 5.2 |                             |
| Week 8  | Oct. 17, 19     | Sections 8.2-8.4 and 1.2  |                             |
| Week 9  | Oct. 24, 26     | Finish Exam 2 material and Review   | <b>Exam 2 Oct. 26</b>       |
| Week 10   | Oct. 31, Nov. 2 | Sections 6.1, 7.1   |                             |
| Week 11   | Nov. 7, 9       | Sections 6.2, 6.3   |                             |
| Week 12   | Nov. 14, 16     | <b>Group Explanation 2</b> due MONDAY by 8am in eCampus; Sections 7.2, 7.3  |                             |
| Week 13   | Nov. 21, 23     | Sections 8.1  | <b>Thanksgiving Holiday</b> |
| Week 14   | Nov. 28, 30     | Sections 6.4 and 7.4 and continue Chapters 6 and 7                          |                             |
| Week 15   | Dec. 5, 7       | Finish Exam 3 material and Review   | Reading Day                 |
| <b>Exam 3 (during the final exam period) in our regular room</b><br>Sec. 502 (9:35 class), Friday, December 8, 12:30 – 2:30 PM<br>Sec. 501 (8:00 class), Monday, December 11, 1:00 – 3:00 PM<br><a href="http://registrar.tamu.edu/General/FinalSchedule.aspx">http://registrar.tamu.edu/General/FinalSchedule.aspx</a> |                 |   |                             |

### Grading Policy

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|--|-----|
| Daily Grades                           | 10% |
| Group Explanations                     | 15% |
| Exam 1 (Sec. 1.3, Ch. 2 and Ch. 3)     | 25% |
| Exam 2 (Sec. 8.2-8.4, Ch. 4 and Ch. 5) | 25% |
| Exam 3 (Ch. 6, Ch. 7 and Sec. 8.1)     | 25% |

### Required Averages

|               |
|---------------|
| A = [90,100%] |
| B = [80,90%)  |
| C = [70,80%)  |
| D = [60,70%)  |
| F = [0,60%)   |

Due to privacy issues,

I cannot discuss grades over email or by phone.

I reserve the right to lower these cutoffs if I deem that it is appropriate, but you should not expect them to be lowered.

### Daily Grades

To earn full points in this category, you will attend class, have your work completed and on your desk by the beginning of class, present your work to the class or your group when requested, share ideas with classmates, and listen attentively when other people share their ideas. **Please attend and participate in all classes.** Most book sections will have a reading assignment to help prepare you for that section of material. This should be completed BEFORE we start that section. Notebook explanations are an opportunity for you to practice written explanations (and oral explanations when you are picked to present) prior to the exam. Homework problems should be completed soon after we finish each section. Your participation in class counts toward your daily grade even when papers are not collected.

### Group Explanations

Explanations (both verbal and written) are vitally important for effective communication of mathematics. Throughout the semester, you will work with group members to submit written explanations to mathematical questions. The group will be assigned and will change for each explanation. The person who is designated as “lead” for that assignment is responsible for organizing the group’s communication and timeline and for submitting the assignment. All group members are expected to contribute to the explanation by writing at least one of the three required explanations, by providing timely and valuable suggestions to the other team members about their explanations, and by thoughtfully responding to suggestions from team members. All team members will be assigned the same grade for the group explanation unless information is presented to indicate the need for a change. I suggest that you start early and work through multiple drafts of the assignment before submitting it.

**By submitting your assignment, everyone in the group is virtually signing this amended honor code:**

On our honor as Aggies, we have neither given nor received any unauthorized aid on this assignment. We attest that the explanations are our own and reflect our own understanding of the question. We have cited all sources that we used in preparation of this assignment. Every group member has written an explanation and has provided timely and valuable suggestions about other portions of the assignment. Every group member made valuable contributions to the assignment and has earned the group grade.

### Exams

The three in-class exams will last the entire class period. Everything discussed in class, experienced within an activity or assignment, or found in the homework, reading assignment, or explanation is fair game for content on an exam. **You will be expected to show all of your work, and many items will require expository writing (such as explanations).** The third exam will be during the official final exam time. The complete final exam schedule can be viewed at <http://registrar.tamu.edu/General/FinalSchedule.aspx>

### Attendance & Make-up Policy

The University views class attendance as the responsibility of an individual student. Attendance is essential to complete this course successfully. University rules related to excused and unexcused absences and make-ups are located on-line at <http://student-rules.tamu.edu/rule07>. Please notify me via email prior to the date of an absence, if possible.

Consistent with Texas A&M Student Rules, in cases where advance notification is not feasible (e.g. accident, or emergency), you must provide notification by the end of the second working day after the absence. This notification should include an explanation of why notice could not be sent prior to the class. For injury or illness too severe or contagious to attend class, you must provide confirmation of a visit to a health care professional affirming date and time of visit. The Texas A&M University Explanatory Statement for Absence from Class form will not be accepted in this case.

It is YOUR responsibility to learn what you missed from class, obtain any notes and assignments, and complete assignments by the regularly scheduled due date. In other words, **missing class on the day work was assigned is not a reason for an extension.**

It is also your responsibility to schedule a make-up if one is needed. Make up exam times can be found at <http://www.math.tamu.edu/courses/makeupexams.html>. Make up exams should be taken at the first opportunity after an exam unless you have a university excused absence for that time too. If the lead for a Group Explanations assignment is unable to turn in the assignment, responsibility should be designated to another team member. Therefore, Group Explanations should be turned in on time unless all group members have a university excuse. All other make-up work should be completed prior to the next class when feasible. No rule can cover every situation. If you encounter extenuating circumstances, **please communicate** with me as soon as possible. No exams will be administered without prior approval, so contact me as soon as possible if you need to miss a scheduled exam or assignment.

If class is officially cancelled for any reason, you can expect that the assignments due/taken on the missed class day will be due/taken the next time the class meets. Please also check eCampus for additional information.

## **Extra Help and Preparing for Exams**

### **Your Professor**

Communication is essential. Please communicate with me before class, after class, during office hours, and via email.

### **Your Classmates**

It is also important to communicate with your classmates. You will learn more and be able to build on each other's ideas if you discuss the material with other people. Please consider setting a regular time to meet. This is a useful idea to carry into your teaching career as well.

### **Thoughtful Practice**

I strongly recommend that you practice problems from the book. These homework problems, if addressed independently, can provide an "exam-like" experience and provide background for your Group Explanations. See the homework list posted in eCampus. You will notice that many of these problems are not like problems from the class notes. The goal is for you to have an opportunity to grapple with thought-provoking problems at your own pace. I will be happy to answer questions after you have worked with the problems. These deeper questions (especially the explanation questions) are great preparation for the exams.

### **Americans with Disabilities Act (ADA)**

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 believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Service building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit <http://disability.tamu.edu>

### **Academic Integrity**

*"An Aggie does not lie, cheat, or steal, or tolerate those who do."*

Academic integrity is vital to an academic community and essential for all students and professors. As an Aggie, you have agreed to know and uphold the honor code. Please review <http://aggiehonor.tamu.edu/> carefully. I will be happy to answer any questions you might have. You will be asked to sign the honor code on your work as a reminder of that commitment. If you ever have a question about whether or not an action would be acceptable under the honor code, please ask your professor BEFORE you take the action. If you don't have time to ask, then consider whether or not you would take the action if your professor was beside you.

For this class, I encourage you to study with your classmates (unless I specifically state otherwise). However, all graded work other than Group Explanations (such as exams, notebook explanations, reading assignments, etc.) must clearly be your own individual work, and you should not discuss graded work with anyone who has not completed that work yet. If you use a source when completing work, cite the source.

### **Classroom Environment**

Please do your part (attitudes, words, and actions) to make our class a place where everyone can feel comfortable exploring mathematical topics without distractions.

### **Copyright of Materials**

All class materials (notes, tests, assignments, reviews, solutions, etc.) are copyrighted and may not be copied or reproduced without permission.