M 316K: Foundations of Arithmetic

Texas Common Number: MATH 1350

Term: Self-Paced

This course offers an analysis, from an advanced perspective, of the concepts and algorithms of arithmetic, including sets; numbers; numeration systems; definitions, properties, and algorithms of arithmetic operations; and percents, ratios, and proportions. Problem solving is stressed throughout the course.

The primary objective of this course is to increase students’ understanding of mathematics as outlined in the Texas State Board for Educator Certification (SBEC) Standards for Early Childhood-Grade 5 (K-5). Other course objectives include:

- Have future teachers experience learning in some of the formats in which they will be expected to teach, in problem-based situations and by discovery methods.

- Have future teachers practice in communicating mathematics. In particular, the following SBEC standards will be addressed:
  - use questioning strategies to identify, support, monitor, and challenge students’ mathematical thinking;
  - translate mathematical statements among developmentally appropriate language, standard English, mathematical language, and symbolic mathematics;
  - provide students with opportunities to demonstrate their understanding of mathematics in a variety of ways using a variety of tools; and
  - use the language of mathematics as a precise means of expressing mathematical ideas.

This course is independent study and is self-paced. Students have five months upon registration in which to complete all coursework, with an additional 30 days allotted for completion of the final exam.

**UT Austin Prerequisite**

One of the following with a grade of at least C-: Mathematics 301, 302, 303D, 305G, 316, Educational Psychology 371, Statistics and Data Sciences 302, 304, or 306.

**Required Materials**


**Course Organization and Assessment**

M 316K consists of eight lessons grouped into four learning modules. Each lesson contains a set of learning objectives, a lesson overview, a self-assessment, and a computer-graded assignment. Three of the lessons also contain a more in-depth assignment that you will prepare on paper and upload to Canvas for review by your instructor. You must wait to receive a score and feedback on all assignments within a given learning module before moving onto the next module. You can expect this feedback within three business days following submission.

**COURSE OUTLINE**

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<tr>
<th>Module 1: Numbers</th>
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<tr>
<td>Lesson 1: Reasoning about Quantities and Numeration Systems</td>
<td>Numbers; problem solving; exercises versus problem solving; numerations systems and bases; exponents</td>
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<tr>
<td>Lesson 2: Natural Numbers and Number Characteristics</td>
<td>Number classifications; natural numbers; divisibility; factors, multiples, prime factorization; deficient, perfect, abundant; Venn diagrams, GCF, and LCM; rounding and estimating</td>
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<tr>
<th>Module 2: Fractions; Ratios, Rates, Proportions, and Percents</th>
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<tr>
<td>Lesson 3: Using Numbers</td>
<td>Multiplication – Lattice method; operations with numbers – integers; decimals; order of operations; important properties (commutative and associative)</td>
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<tr>
<td>Lesson 4: Fractions</td>
<td>What is a fraction; visualizing fractions; mathematical operations with fractions; analyzing fractions; fraction problems</td>
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Midterm Exam

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<th>Module 3: Algebraic Reasoning</th>
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<tr>
<td>Lesson 5: Proportional Relationships</td>
<td>Fractions, decimals, and percents; proportional relationships; percent problems; percent change</td>
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<tr>
<td>Lesson 6: Introduction to Algebra</td>
<td>What is algebra; patterns, expressions, and equations</td>
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<th>Module 4: Rates of Change</th>
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<td>Lesson 7: Applications of Algebra</td>
<td>Graphing linear functions; linear equations</td>
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<tr>
<td>Lesson 8: Applications of Rate of Change</td>
<td>Rate of change; linear systems of equations</td>
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Final Exam
ASSIGNMENTS

*Computer-Graded Assignments*
Each lesson contains a computer-graded assignment consisting of 10 multiple-choice questions. Computer-graded assignments may only be taken once. They are graded instantly by the course system. To help you prepare for these assignments, each lesson also contains a self-assessment with 10 multiple-choice questions. Self-assessments are not graded; they are provided to assist you in learning the lesson material. You can complete self-assessments as many times as you like, and they have no effect on your course grade.

*Instructor-Graded Assignments*
Modules 1, 2, and 3 contain an instructor-graded synthesis assignment. For these assignments, you will first print the assignment PDF file, and then complete the printed assignment by hand in pencil or pen. Make sure that your writing is dark and clear so that it will be legible when scanned. Scan the completed assignment. **You must combine all of your scans into a single file for submission.**

Because you will not be taking the course in a classroom, it is important that you show all of your work in your assignments. That way your instructor can see if you fully understand the material and can give you the instructional feedback you may need to increase your understanding of the material. The Canvas Inbox gives you the means to communicate easily with your instructor whenever you have questions.

EXAMS

You will take the midterm and final exams at a proctored testing center. The exam request links within your course will take you through this process; additional information is available on the University Extension website.

*Midterm Exam:* The midterm exam covers modules 1 and 2. It consists of 10 questions and is worth 20% of your final course grade. You will have three hours in which to take it. It is closed-book, and you may **NOT** use any type of calculator. To prepare for the exam, review the overviews in each lesson as well as the assignments. The *Midterm Exam Overview and Request Link* page in Canvas contains a detailed overview of the themes covered on the exam, as well as a practice exam. You may request the midterm at any time, but it is recommended that YOU wait until you have received grades and feedback on all assignments in Modules 1 and 2 before taking the exam.

*Final Exam:* The final exam is comprehensive, covering all lessons. It is worth 30% of your course grade. Like the midterm, the final exam contains 10 questions. You will have three hours in which to take it, and may not use your textbook or a calculator. The *Final Exam Overview and Request Link* page in Canvas contains a detailed overview of the themes covered on the exam. Complete the practice final exam for additional practice before taking the final.

To be eligible to request your final exam, you must have submitted all assignments and received a grade on the midterm exam. You must request your final exam before your course end date.

**YOU MUST PASS THE FINAL EXAM TO PASS THE COURSE.**
Grades and Course Extensions

Your final grade for the course will be calculated as follows:

3 Instructor-Graded Assignments 30%
8 Computer-Graded Assignments 20%
Midterm Exam 20%
Final Exam 30%

You must pass the Final Exam to pass the course. You must also earn an overall passing grade:

A 100-93%  B+ 89-87%  C+ 79-77%  D+ 69-67%  F 59-0%
A- 92-90%  B 86-83%  C 76-73%  D 66-63%
B- 82-80%  C- 72-70%  D- 62-60%

Strategies for Success

This course allows you to work completely at your own pace and in any setting you choose. The freedom of a self-paced course, however, means that more responsibility will fall upon you to manage your coursework so that you complete the course requirements within the enrollment period and in time for any graduation or other personal deadlines.

Here are some suggestions for success:

1. Read "Getting Started and Required Information" and the "Course Overview" very carefully. You should be aware of all guidelines concerning course regulations, integrity of work, and preparation of lessons.

2. Begin your lessons as soon as possible. Establish a schedule for yourself and stick to it. Try not to let too much time pass between lessons; you don’t want to forget what you have learned so far! Don’t procrastinate. This is especially important if you are about to graduate. Leave yourself plenty of time for getting assignments graded and for taking exams. You don’t need the added stress of taking your final at the last possible moment.

3. Be sure to read (and re-read) the Lesson Overviews before beginning your assignments. Mathematics can be difficult to read, so don’t be frustrated if things aren’t quite clear the first time through.

4. Use the Canvas Inbox to ask questions about your assignments or other lesson material. Communicate regularly with your instructor about any problems you are experiencing.