

Math 1330–004: Arithmetic Problem Solving

11:00-12:20 TTh, 304 Pickard Hall, Fall 2008

Instructor: Dr. Christopher KRIBS ZALETÀ

Office: 483 Pickard Hall

Phone: (817)272-5513, fax 272-5802

email: kribs@mathed.uta.edu

WWW: <http://mathed.uta.edu/kribs/>

Office Hours: before/after class and by appointment

Prerequisites: College algebra and consent of instructor

Text materials: Coursepack — available on the web site

NOTE: I have several traditional textbooks available in my office for checkout as reference.

Course home page: <http://mathed.uta.edu/kribs/1330.html> (*general*), [my1330.html](http://mathed.uta.edu/kribs/my1330.html) (*specific*)

Syllabus: An approximate schedule with topics is given below.

Unit	Topic	#Wks	Approximate Dates
1	Problem Solving	3	Aug 26 - Sep 11
2	Operations	2	Sep 16 - Sep 25
3	Numeration Systems	3	Sep 30 - Oct 21
	<i>Midterm exam</i>	1/2	Oct 14, in class
4	Fractions	3	Oct 23 - Nov 11
5	Number Theory	3	Nov 13 - Dec 02
	Final review	1/2	Dec 04
	<i>Final exam</i>		Tue Dec 09 11:00 AM–1:30 PM

Last day to withdraw: October 30

Class policy on drops, withdrawals, academic honesty, and accommodating disabilities follows the University policy on these matters. Copies can be obtained upon request.

LEARNING OUTCOMES: This course is designed to prepare future elementary school teachers *mathematically* to teach math (as opposed to *pedagogically*, which is the goal of ECED/BEEP 4311 and EDML 4372). It does this in two main ways: by teaching math which is relevant (not identical) to the math they will be teaching, and by modeling a math classroom through problem-solving activities, cooperative groups, and accountability for deciding (reasoning) what is correct.

After completing this course, students will be able to:

- identify and use problem solving techniques
- analyze properties of binary operations
- list and recognize conceptual models for arithmetic operations
- perform arithmetic in other number systems
- convert between fractions and decimals
- explain and justify common divisibility tests
- solve elementary number theory problems
- find numbers with a given number of factors
- give clear, rigorous math explanations

PHILOSOPHY: There will be almost no lecturing in this course. To help you develop your intuitive reasoning and problem-solving skills, we will spend most of our class time working in small groups on problems from the course packet. An important part of learning to solve problems is being willing to struggle with a problem even after you get stuck, and this is one of the first things you will face this term. You may be surprised by how much you can do if you just keep at it!

We will usually discuss the problems in a large group after most groups have finished them. Sometimes you will be asked to write up your ideas and solutions, but *always* you are expected to think about the problems, participate in solving them, and communicate your ideas with others. Communicating your ideas clearly to others is as important as developing them in the first place.

GRADES: Your grade for the course will be determined by two exams (20% each), by attendance and participation (20%), and in large part by written work you will turn in (40%).

THE EXAMS will be similar in nature to the problems we work in class, but short enough to be completed in the time given. A sample exam will be distributed before each exam in order to give you a closer feel for it, though you should *not* expect it to serve as an exact blueprint for the real thing. The dates and times for the midterm and final exam (both in our usual room) are given above. Please mark them on your calendar now so as to avoid conflicts. If a conflict arises, *please* see me as soon as possible to resolve it. No make-up exams will be given without prior arrangement. The midterm will be closed-notes; the final will be open-notes.

ATTENDANCE AND PARTICIPATION are a significant part of your grade because this course is more an experience than a set of material to be learned. Most of what I hope will happen for you in this course will take place inside the classroom, working in groups and talking with others. Attendance will be taken by means of a daily sign-in sheet. You may miss up to 3 days (excused or not) without penalty; after that your grade is multiplied by the proportion of classes attended. Arriving late (after we have started class) or leaving early counts as half an absence. It also means missing important announcements, often made at the beginning or end of class. Students with special needs, or other situation which affects their attendance for several consecutive classes, should consult with the instructor as soon as possible.

It is also in your interest to participate in the group problem solving sessions since active learning is better than passive learning. Participation includes both small and large group work. Participation in small groups means coming to class prepared (working on a problem outside of class, or bringing requested materials to class), working productively with groupmates, and making sure everyone in your small group understands you. Large group participation means making a tangible contribution (spoken or written on the blackboard or class bulletin board) about once a week. If you don't feel comfortable answering questions, *ask* one of your own: questions spur discussion as much as answers, and you'll be doing a favor to classmates wondering the same thing.

THE WRITTEN WORK will have two components: write-ups (also called problem reports) and reflections. A write-up is a detailed solution to a problem we discussed in class. These write-ups should be readable independently of any worksheet on which they are based, in good English and either legibly handwritten in ink or word-processed. They should always include the following (although you need not use this form): 1. a statement of the problem at hand, 2. any strategies you used to attack the problem, 3. the solution you obtained, with an explanation of how you got it (and how you know it is complete), and 4. a conclusion that says what we can take with us from the problem. Communication of what you understand (even if it's not a complete understanding) is at least as much the point as finding the solution.

I will also sometimes ask you to write a reflection on a rather less concrete issue, like "What does it mean to get stuck?" These essays, usually a page or two in length, will be graded more loosely, more on how much thought went into it than on organization and content.

I will let you know at the time I assign written work when it is due, but typically it will be due in class a week from the time it is assigned, and you will have roughly one assignment due per week. Each student is allowed one late submission per semester, but all written work must be turned in before the same assignment is handed back to the rest of the class, to receive credit. Each student is allowed one electronic (e-mail) submission per semester (faxed papers do not count). At the end of the semester, each student will have the opportunity to rewrite one assignment.

If you find you are having difficulty with written assignments, I encourage you to consult me, one of the other 1330 instructors, or your classmates, bringing a draft of the paper to go over. Small groups whose members revise each other's drafts historically tend to do better on them.

These are *your* blackboards. Own the classroom.