

Math 4303 (3 credits)
TuTh 1:30–2:50
LART 206

FUNDAMENTALS OF MATH
Syllabus

Fall 2011

Instructor: **Dr. Art Duval**

office: **Bell Hall 303**

phone: **747-6846**/office (24hrs./day; if I'm not in, please leave a message)
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<http://www.math.utep.edu/Faculty/duval/home.html>

Office hours: **Mon, 2:00–3:00; Tue, Thu, 10:00–11:00; Wed, 9:00–10:00**. Please feel free to come by my office any time during scheduled office hours. You are welcome to come at other times, but in that case you might want to make an appointment, just to make sure that I will be there then. You can make an appointment simply by talking to me before or after class, by calling me at my office or at home, or by sending e-mail.

You may also ask any questions directly via phone or e-mail. If I'm not in when you call, please leave a message on the voice-mail or answering machine with your name, number, and a good time for me to call you back. I will try to respond to your phone or e-mail message as soon as possible.

Website: <http://www.math.utep.edu/Faculty/duval/class/4303/114/home.html>

Here you will find this syllabus with relevant links, including homework and reading assignments for the whole semester, as they are announced. Other resources may become available.

Prerequisites: MATH 3325, or an equivalent course where you learn the basics of writing proofs. I further recommend that you take this course only after taking several other advanced (proof-based) courses.

COURSE OBJECTIVES: This course was designed as a capstone experience to your mathematical preparation to teach high school math, by being the connection between your college courses and the topics you will teach in high school. However, this is not a pedagogy course, or even a math methods course, and it is not a repeat or review of high school math (though you may find yourself understanding better some of the topics and ideas you first saw in high school); in particular, you will have to prove theorems.

Upon successful completion of this course, you will be able to find for yourself the deeper mathematics underlying topics from high school. In particular, you will be able to explain why the rules and procedures of high school math work as they do, and why the definitions are set as they are. You will be able to place high school math problems in larger context; you will be able to show how they generalize, and what other problems they relate to.

Particular topics include real and complex numbers, functions, algebraic structures and solving equations, natural numbers, divisibility properties of integers and polynomials, and number fields. (Note that geometry is part of a different course at UTEP.)

Textbook: **Mathematics for High School Teachers — An Advanced Perspective, Usiskin, Peressini, Marchisotto, and Stanley, Part I** (Chs. 2–5). We may skip some sections, as announced in class. The textbook is required at all class meetings.

GRADES:

Participation (15%) Large portions of class time will be given to student presentations of solutions to problems from the textbook, while I serve as moderator. Presentations will be evaluated on: the quality and correctness of the content; the clarity of the presentation; the difficulty of the problem; and the frequency of your contributions. Making substantial progress, or asking a good question, about a harder problem without solving it may be worth as much as solving an easier problem.

When you are in the audience, you are still expected to be actively engaged in the presentation. This means checking to see if every step of the presentation is clear and convincing to you, and speaking up when it is not. Note that by speaking up in these situations, you will probably **help** the presenters' grades, by giving them a chance to improve their presentation! When there are gaps in the reasoning, the class will work together to fill the gaps.

Your grade will be based on your **overall** contribution to keeping the course moving (which includes forward progress, making sure presentations are complete and correct, helping other students' understanding) and on your ongoing understanding of the material. Presentations will count approximately twice as much as audience participation. I will use the following rubric:

- A** Clear, correct presentations to most problems; helpful audience participation including appropriate feedback and good questions.
- B** Correct presentations to routine problems; active audience participation including questions and discussions.
- C** Correct presentations to easier problems, and reasonable attempts at routine problems; responding in the audience when called on, posing questions when you are confused, and participating in discussions.
- D** Less than satisfactory work, but an apparent honest effort to understand material. At least some presentations with reasonable attempts; participating in the audience with questions or comments.

Homework (15%) Written homework will be assigned approximately biweekly, announced in class, and posted on the course website. These solutions should be written clearly and completely. Assignments will be due at the *beginning* of class. No late homeworks! (Incomplete homeworks *will* be accepted, though.) If an emergency prevents you from delivering your homework on time (or having someone else deliver it for you), please let me know as soon as possible.

You are encouraged to work together on your homework, but you must write up your solutions by yourself.

Class presentation (20%) Small groups of students will design and conduct all classroom activities for part of one class session and will be responsible for the content covered in those sessions. Each group will also create homework assignments.

Final project (20%) There are mathematics problems that require more attention than just one day. Some of these problems are found at the end of the chapters in the textbook. Small student groups will complete one of these problems and present the results in class and in a written report at the end of the semester.

Exams (15% each) There will be two in-class, closed-book exams on the following days:

Thu. 29 Sep.
Thu. 10 Nov.

Each exam will cover material from the beginning of the semester, though the second exam will focus more on material since the first exam. Makeup exams can be given only in extraordinary and unavoidable circumstances, and with advance notice. There will be no final exam.

POLICIES:

Academic dishonesty: It is UTEP's policy, and mine, for all suspected cases or acts of alleged scholastic dishonesty to be referred to the Dean of Students for investigation and appropriate disposition. See Section 1.3.1 of the Handbook of Operating Procedures.

Attendance: Due to the course structure, attendance is mandatory. There is no particular penalty for missing a particular class, but you cannot get a good participation grade if you miss too many classes. I will usually "excuse" an absence if you tell me about it in advance, or, in cases of emergencies, as soon as possible afterwards.

My goal is for class meetings and activities to complement, rather than echo, the textbook, and thus for every class to be worth attending.

Drop date: The deadline for student-initiated drops with a W is Friday, October 28. After this date, you can only drop with the Dean's approval, which is granted only under extenuating circumstances.

I hope everyone will complete the course successfully, but if you are having doubts about your progress, I will be happy to discuss your standing in the course to help you decide whether or not to drop. You are only allowed three enrollments in this course, and students enrolled after Fall 2007 are only allowed six withdrawals in their entire academic career, so please exercise the drop option judiciously.

Courtesy: We all have to show courtesy to each other, and the class as a whole, during class time. Please arrive to class on time (or let me know when you have to be late, and why); do not engage in side conversations when one person (me, or another student) is talking to the whole class; turn off your cell phone (or at least set it to not ring out loud), and do not engage in phone, email, or text conversations during class.

Disabilities: If you have, or suspect you have, a disability and need an accommodation, you should contact the Disabled Student Services Office (DSSO) at 747-5148, dss@utep.edu, or Union East room 106. You are responsible for presenting to me any DSS accommodation letters and instructions.

Exceptional circumstances: If you anticipate the possibility of missing large portions of class time, due to exceptional circumstances such as military service and/or training, or childbirth, please let me know as soon as possible.