

Math 3325 (3 credits)
MWF 11:30–12:20
LART 206

PRINCIPLES OF MATH
Syllabus

Spring 2009

Instructor: **Dr. Art Duval**

office: **Bell Hall 303**

phone: **747-6846**/office (24hrs./day; if I'm not in, please leave a message)

747-6502/fax (include a cover sheet with my name, please)

545-1788/home (9am-9pm only, please)

internet: artduval@math.utep.edu

<http://www.math.utep.edu/Faculty/duval/home.html>

Office hours: **Mon, 9:00–10:00; Tue, 10:00–11:00; Thu, 1:00–3:00.** 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/3325/091/home.html>

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

Prerequisites: Calculus II (Math 1312). This is entirely a mathematical maturity requirement, as we will use no calculus in this course.

COURSE OBJECTIVES: Upon successful completion of the course, you will be able to construct straightforward proofs in a variety of settings. You will be able to make use of existing theorems, and employ basic mathematical techniques of proof (induction, proof by contradiction, contrapositives, etc.) and the building blocks of mathematical language (sets, functions, and relations). Your proofs will be in clear and complete English sentences, accompanied by clarifying diagrams where necessary.

You will be prepared for further study of other specific topics in proof-based mathematics.

Note: This is very different from calculus and differential equations, where you mostly performed computations to solve problems. Although there is still problem-solving in this course, we will emphasize *proving* your answers are correct, and not just *finding* answers. This is what almost all your future advanced math courses will be like.

Textbook: **Chapter Zero, 2nd. ed., Carol Schumacher, Chs. 1–5.** This book differs from other texts for proof-based courses, in that the proofs of the theorems are not included. The point of this is for you, the student, to fill in these details, in order to be more actively involved with the material. To make this task more manageable, intermediate results to help guide you are included. Read pages xiii–xiv of the preface (“A Note to the Student: What This Book Expects from You”) carefully for more details.

Course structure: The course is built around student presentations of proofs of results, and solutions to problems, from the textbook, while I serve as moderator. (I will also occasionally give short presentations to put topics into a wider context.) I will announce the approximate schedule I expect us to follow about one week in advance, and maintain that information on the course website.

Each result or problem will have a due date for you to turn in your solution, before we discuss it in class. I will grade these mostly for effort. Keep a copy of your work; I will not return it until after we discuss it in class! I will pick students (sometimes asking for volunteers on harder proofs) to present their work in class. I will sometimes use your written solutions (which you submitted in advance) to pick who will present a problem.

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.

GRADES:

Participation (30%) Your presentations, audience participation, and advance written solutions will contribute to this portion of your grade, though presentations will count approximately twice as much as the other two components combined. 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. I will use the following rubric:

- A** Clear, correct presentations to most problems; helpful audience participation including appropriate feedback and good questions; almost all problems written up in advance.
- B** Correct presentations to routine problems; active audience participation including questions and discussions; almost all routine problems, and some harder problems, written up in advance.
- 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; most routine problems written up in advance.
- 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; some problems written up in advance.

Homework (10%) 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.

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

Fri., 27 Feb.
Wed., 8 Apr.

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 tests can be given only in extraordinary and unavoidable circumstances, and with advance notice.

Final (30%) The final exam will be comprehensive over all material we discuss in class. The final will be on

Wed., 13 May, 1:00–3:45 p.m.

POLICIES:

Collaboration: You may **not** consult books, the Internet, other people outside of class, or other sources to solve the problems or write your solutions. I do strongly encourage you to work with your classmates on the problems in advance. I also encourage you to talk to me frequently, more than in other courses. Feel free to ask questions about the material, show me your work before presenting it in class, and even just talk about your frustrations.

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 for Operating Procedures.

Attendance: Due to the course structure, attendance is mandatory. For every three unexcused absences, you will receive a zero for an in-class presentation. I will usually excuse an absence if you tell me about it in advance, or, in cases of emergencies, as soon as possible afterwards.

Drop date: The deadline for student-initiated drops with a W is Friday, April 3. 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.