

Math 3325 (3 credits)
CRN 13896
TuTh 12:00–1:20, EDUC 309

PRINCIPLES OF MATH
Syllabus

Fall 2017

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: adual@utep.edu

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

Office hours: **Mon, Wed, 1:00–2:00; Tue, Thu, 1:00–2:00**. Please feel free to come by my office any time during scheduled office hours. You are welcome to visit 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/3325/174/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: 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.). Your proofs will be in clear and complete English sentences, accompanied by clarifying diagrams where necessary.

You will also be able to analyze moderately complicated proofs in analysis and algebra. You will be able to identify the difficult steps, and to justify each step from previous ones.

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: **A Transition to Advanced Mathematics, Smith, Eggen, and St. Andre, 8th ed.**

We will go through Chapters 1-5, skipping a one or two sections from each chapter (to be announced in class), and then the first half or so of Chapter 6. We will generally discuss one section per class meeting, though Chapter 1 will go a bit faster.

Reading: Read each section that we cover in class, both before and after class. Skim the section before class, even if you don't understand it fully, to have some idea of what we'll be doing in class. Read it more carefully after class to clarify and fill in details you missed in class.

Warning: Sometimes, we will not "cover" all the material from a section in class, but instead focus on a particular aspect of the section. In such cases, I will point out in class (and on the course's website) which other parts of the section I expect you to read on your own.

GRADES:

Participation (10%) Large portions of class time will be given to student presentations of solutions to routine 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.

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

- A** Clear, correct presentations to almost all problems; helpful audience participation including appropriate feedback and good questions.
- B** Correct presentations to most problems; active audience participation including questions and discussions.
- C** Correct presentations to easier problems, and reasonable attempts at other 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 (25%) Written homework will be assigned weekly, 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, and will not be accepted after then, except in extenuating circumstances that you explain to me as soon as possible. Incomplete homeworks will be accepted, though, so please turn in whatever work you have completed when homework is due. You are encouraged to work together on your homework, but you must write up your solutions by yourself. Your lowest homework score will be dropped.

Peer Assessment (5%) Approximately once every two weeks you will be responsible for providing formative assessment for 3-4 other students' written homework. "Formative assessment" means you provide helpful written feedback, but not a grade. This part of the course will only contribute to the grade of the student providing the assessment, not the student turning in the homework problem. As long as you treat the assessing job seriously, you will get full credit for this part of the course.

Each class period, you will turn in a written solution to one homework problem (sometimes two closely related problems) announced in the previous class. I will distribute these submissions to the students whose turn it is to provide the assessment. When it is your turn to provide the assessment, you will need to return the submissions, with your helpful written feedback, to me before the next class meeting (so I have a chance to scan for any issues). I will work with you to minimize (I hope to zero) the number of times you have to provide assessment at a difficult time in the semester for you, and to equalize the number of times each student has to provide assessment during the two days between Tuesday and Thursday.

You are welcome to ask me about these problems at any point, both while you are solving the problem and when you are providing assessment. You may also work with other students, but let me know whom you are working with, so that they are not then also assessing your work. If you ever have any complaints or questions about the assessment you receive from your fellow students, please let me know.

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

Thu. 28 Sep.
Thu. 16 Nov.

You will have to recall and explain definitions, reproduce proofs from class, and present short proofs to new problems. 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.

Final (30%) The final exam will be comprehensive over all material we discuss in class. It will be similar to the in-class exams, but longer, and may ask you for some more involved proofs. The final exam will be on

Tue. 12 Dec., 1:00–3:45 p.m.

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 Office of Student Conduct and Conflict Resolution for investigation and appropriate disposition. See Section II.1.2.2.1 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.

Drop date: The deadline for student-initiated drops with a W is Friday, November 3. After this date, you will not be able to drop the class (as per the Dean's office). Furthermore, a grade of incomplete is only for extraordinary circumstances, such as a missed exam.

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, for emergencies, 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 Center for Accommodations and Support Services (CASS) at 747-5148, cass@utep.edu, or Union East room 106. You are responsible for presenting to me any CASS 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.