

# MATH 3325: Principles of Mathematics

CRN: 23397

Spring 2024

Liberal Arts, room 101

Mondays, Wednesdays, 4:30-5:50

3 credit hours

Instructor: Dr. Art Duval

Office: Bell Hall, room 303

Phone:

*(915)747-6846/office: 24 hours/day; if I'm not in, please leave a message.*

*(915)747-6502/fax: Include a cover sheet with my name, please.*

Internet: [aduval@utep.edu](mailto:aduval@utep.edu),

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

Office hours:

- Mondays, 10:00-11:00
- Tuesdays, 2:00-3:00
- Wednesdays, Thursdays, 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 calling me, or by sending e-mail. You can just propose a time, and I will respond either by agreeing to that time, or, if I cannot make it then, I will propose different times.

Alternatively, you can talk with me by Zoom at [an address given during class or on Blackboard] during office hours or by appointment.

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 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.

**Prerequisite:** 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.



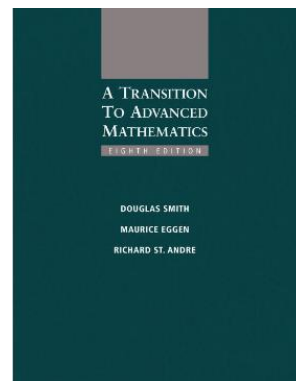
You will also be able to analyze moderately complicated proofs in analysis and algebra. You will be able to identify the difficult steps, and to justify each step from previous ones.

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.

## Required Materials

*Textbook:* *A Transition to Advanced Mathematics, Smith, Eggen, and St. Andre, 8th ed. (Cengage)* We will go through Chapters 1-5, skipping one or two sections from each chapter (to be announced in class). We will generally discuss one section per class meeting.



## Technology Requirements

*Blackboard:* Announcements, assignments, and course grades are all delivered via the Internet through the Blackboard learning management system (LMS). Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Mozilla Firefox and Google Chrome are the most supported browsers for Blackboard; other browsers may cause complications with the LMS. When having technical difficulties, update your browser, clear your cache, or try switching to another browser. Check for announcements on Blackboard, or via your UTEP e-mail account (where announcements will also be sent), at least once per day.

*Gradescope:* We will be using Gradescope, which allows us to provide fast and accurate feedback on your work. Assignments (except for peer assessments) will be submitted through Gradescope, and assignment and exam grades and feedback will be returned through Gradescope. As soon as grades are posted, you will be notified immediately so that you can log in and see your feedback. Grades (but not feedback) will also be posted on Blackboard.

Your Gradescope login is your UTEP email, and your password can be changed at the following link: [https://gradescope.com/reset\\_password](https://gradescope.com/reset_password). The same link can be used if you need to set your password for the first time. More support for Gradescope can be found [here](#).

*Scanning:* You may want to be able to upload your handwritten work for assignments. To do this, you will need to be able to scan your work, and upload it to your computer. If you don't have access to a scanner (they are sometimes built into all-in-one printers), you can use phone apps such as GeniusScan, TinyScanner, CamScanner, AdobeScan, and the scanning feature of the Notes app in iOS. Please upload your work as a .pdf file. (Using your phone camera to take a picture leaves the document in a format that is harder for me to work with.)

*LaTeX/Overleaf (optional):* If you prefer to type your work, I strongly recommend using LaTeX. (Typing math in a normal word processing system is often clumsy.) LaTeX produces textbook-quality mathematical typesetting, yet the commands you'll need for homework are mostly very simple. If you haven't used LaTeX before, but you want to use it now, then the best way to learn and use LaTeX is through the free

website [Overleaf](#), which has good tutorials to get you [started quickly](#), and an [extensive help page](#) if you want to do anything more advanced.

## GRADES

### Participation (10%)

Your active participation in class is necessary for the success of both you and your classmates. This participation will take many forms: Some class time will be spent on discussion in small groups or with the whole class over new material, and close reading of proofs and examples in the textbook. You will need to fill in details, ask questions, and answer classmates' questions.

You will also present of solutions to routine problems from the textbook, while I serve as moderator. You will probably not be able to solve all the homework problems, and that is okay. If you did not completely solve a problem, you can share what you tried and how it worked. These situations often lead to the best discussions.

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, so that we can all work together to fill in any gaps in reasoning, and to create sound mathematics.

*Participation rubric:* At the end of the semester, I will evaluate your overall contribution to this part of the course according to the following rubric. (See grading scale below.)

- **5:** Insightful contributions to class discussions that move the conversation forward; clear, correct presentations to most problems; helpful audience participation, including appropriate feedback and good questions.
- **4:** Active participation in class discussions; correct presentations to most problems; good questions and frequent suggestions during audience participation.
- **3:** Responsive participation in class discussions; correct presentations to easier problems; questions and some suggestions during audience participation.
- **2:** Some participation in class discussions; reasonable presentations to problems; asking questions when you are confused.
- **1:** Regular polite participation; attempted solutions to problems.

Note that a good question is sometimes more helpful than a correct answer. In particular, if you are confused about something, then try to describe your confusion as clearly as you can, ideally in the form of a question someone could answer that would help you.

### Homework (25%)

Most weeks, homework will be posted on Gradescope, and due Sunday evenings. You are encouraged to work together on your homework, or ask me for help, but you must write up your solutions by yourself. Your lowest homework score of the semester 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.

Most weeks, you will submit through Blackboard written solutions to two homework problems to be graded by your peers. You will submit your solutions by Tuesday evening. Your submissions will then be (electronically) distributed to the students whose turn it is to provide the assessment. On Wednesday in class, we will discuss the solutions, and grading rubrics. When it is your turn to provide the assessment, you will use Blackboard to provide your helpful written feedback on one problem for several students. Your feedback will be due Saturday evening. 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.

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. If you ever have any complaints or questions about the assessment you receive from your fellow students, please let me know.

### Exams

There will be two exams during the semester, and a comprehensive final exam. You will have to recall and explain definitions, reproduce proofs from class, and present short proofs to new problems. The two exams during the semester will cover material from the beginning of the semester, though the second exam will focus more on material since the first exam. All exams are closed book and closed note, with no calculators allowed.

Once you begin an exam, you will not be allowed to leave the classroom until you have finished the exam. There will be no bathroom breaks. If you have a medical reason for needing more frequent bathroom breaks, please provide documentation in advance.

### In-class Exams (15% each)

- Exam 1, **Wednesday, February 21**
- Exam 2, **Wednesday, April 10**

### Final Exam (30%)

**Monday, May 6, 4:00 – 6:45 p.m.**

### Grading scale

All grades will be converted to a scale where 4 is the minimum score for an A, 3 is the minimum score for a B, 2 is the minimum score for a C, and 1 is the minimum score for a D.

### Late work

*Homework:* Extensions on homework deadlines will only be given under unusual circumstances, and with an explanation. (Too much work in other classes is not a sufficient explanation.) It is generally better to submit an incomplete assignment than a late assignment. Remember, too, that the lowest homework score of the semester will be dropped, and this is usually the best solution for that one week in the semester when everything in your life goes wrong.

*Exams:* Make-up exams will only be given under extraordinary and unavoidable circumstances, and with advance notice if possible. You will need to provide written documentation. If you anticipate a conflict

with any exam date, please contact me as soon as possible. Otherwise, please make space on your calendar right now for all exams.

## POLICIES

### Attendance

Due to the course structure, attendance is mandatory (but stay home if you are sick). There is no penalty for missing a particular class, but you cannot get a good participation grade if you miss too many classes. You are responsible to find out any assignment that must be made up if you are absent. I will usually excuse an absence if you tell me about it in advance, or, in cases of emergencies, as soon as possible afterwards.

### 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.

### Scholastic Integrity

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as one's own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. I report all suspected violations of academic integrity to the [Office of Student Conduct and Conflict Resolution \(OSCCR\)](#) for investigation and possible disciplinary action. To learn more, see [HOOP: Student Conduct and Discipline](#).

### Guidance on Artificial Intelligence

Use of AI technologies or automated tools, particularly generative AI such as ChatGPT is not allowed for assignments in this class. Each student is expected to use critical and creative thinking skills to complete tasks and not rely on computer-generated ideas. Any direct use of AI-generated materials submitted as your own work will be treated as plagiarism and reported to the Office of Student Conduct and Conflict Resolution (OSCCR).

### Copyright Statement for Course Materials

All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated.

### Student Resources

UTEP provides a variety of student services and support:

- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.

- [UTEP Library](#): Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.
- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Student Success Help Desk \(SSHD\)](#): Students experiencing challenges or obstacles to academic success including registration, financial, food, housing, and transportation resources may submit a ticket request assistance to [studentsuccess@utep.edu](mailto:studentsuccess@utep.edu)
- [Military Student Success Center](#): UTEP welcomes military-affiliated students to its degree programs, and the Military Student Success Center and its dedicated staff (many of whom are veterans and students themselves) are here to help personnel in any branch of service to reach their educational goals.
- [Center for Accommodations and Support Services](#): Assists students with ADA-related accommodations for coursework, housing, and internships.
- [Counseling and Psychological Services](#): Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.
- [UTEP Food Pantry](#): Non-perishable food items are available to students who are currently enrolled in classes. Bring a Miner Gold Card to Memorial Gym, Room 105, Monday through Friday, 10 a.m. to 2 p.m.

For additional services and support, click [here](#), or refer to the QR code to the right, for a listing of campus resources.



### Drop Policy

To drop this class, please contact the [Registrar's Office](#) to initiate the drop process, by the deadline of Thursday, March 28. 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 only six withdrawals in your entire academic career, so please exercise the drop option judiciously.

### Accommodations Policy

The University is committed to providing reasonable accommodations to students with documented disabilities. Students who become pregnant may also request reasonable accommodations, in accordance with state and federal laws and regulations and University policy. Accommodations that constitute undue hardship are not reasonable. If you have, or suspect you have, a disability and need an accommodation, please register with the [UTEP Center for Accommodations and Support Services \(CASS\)](#). You can contact CASS at (915)747-5148 or [cass@utep.edu](mailto:cass@utep.edu), or apply for accommodations online via the [CASS portal](#).

### Exceptional Circumstances

If you anticipate the possibility of not being able to participate in the course due to exceptional circumstances such as military service and/or training, childbirth, etc., please let me know as soon as possible.