

MATH 4303: Fundamentals of Mathematics from an Advanced Standpoint (ONLINE)

CRN: 24805

Spring 2021

3 credit hours

Instructor: Dr. Art Duval

Internet: adual@utep.edu, <http://www.math.utep.edu/Faculty/duval/home.html>

Phone:

(915)747-6846/office: I'm not there this semester, but you can leave a message any time of day or night, and it will be sent to me by email.

(915)747-6502/fax: Probably not effective while we are all working remotely.

(915)545-1788/home: 9am-9pm only, please; the line has a lot of static now, but we are trying to fix it.

Office hours: at <http://tinyurl.com/ArtDuvalSpring21>

Please visit me at the above link any time during scheduled office hours:

- Mondays, 1:00-2:00
- Tuesdays, 10:00-11:00
- Thursdays, 1:00-2:00
- Fridays, 10:00-11:00

I am also available at other times, so you are welcome to ask to meet with me at a time that is more convenient to you. 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.

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.

Prerequisite: Principles of Mathematics (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

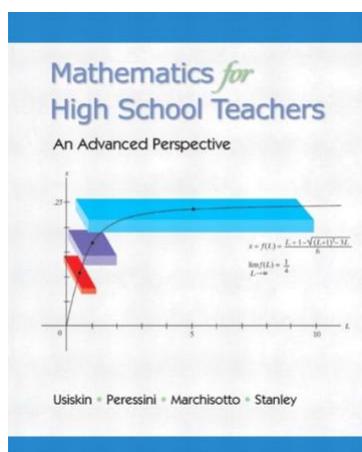
This course was designed as a capstone experience to your mathematical preparation to teach high school math, by being the connection between your college courses and the topics you will teach in high school. However, this is not a pedagogy course, or even a math methods course, and it is not a repeat 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. (Note that geometry is part of a different course at UTEP.)

Required Materials



Textbook: Mathematics for High School Teachers: An Advanced Perspective, by Usiskin, Peressini, Marchisotto, and Stanley (Pearson). We will discuss Part I (Chapters 2-4).

Technology Requirements

Blackboard: Course content is 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.

Zoom: Class meetings and office hours will be held on Zoom. The links to class meetings and office hours are in the Blackboard site, so you can access them there. More support for Zoom can be found [here](#).

Gradescope: We will be using Gradescope this term, which allows us to provide fast and accurate feedback on your work. Homework and exams will be submitted through Gradescope, and homework and exam grades 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 will also be posted on Blackboard.

Your Gradescope login is your university email, and your password can be changed at 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 will probably want to be able to upload your handwritten work for homework and exams. 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, and AdobeScan. 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.)

Communication: To meaningfully participate in class discussions (see below), your computer will need at least a built-in microphone. To reduce feedback, it will be helpful (but not necessary) to have headphones, and sound quality is even better if those headphones also have a microphone. Your computer will need a camera if you want to be seen during class discussions, but this is not necessary.

Technical difficulties: If you encounter technical difficulties beyond your scope of troubleshooting, please contact the [Help Desk](#) as they are trained specifically in assisting with technological needs of students.

Weekly Meetings, Tuesdays, 1:30-2:50

We will meet synchronously via Blackboard Collaborate on Tuesdays, 1:30-2:50, to participate in activities that introduce that week's materials. Instructional videos will not be available until after Tuesday's session, though you can read the textbook sections in advance. Be ready to work, to share, and to ask questions. These meetings are optional, but highly recommended.

During the last three weeks of class, we will also meet Thursdays, 2:00-2:50, to accommodate the class presentations that will take place then.

Class Recordings

Tuesday class discussions will be recorded, and then posted on Blackboard later that day. The use of recordings will enable you to have access to a class discussion in the event you miss it, or even if you just want to see it again. Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA) and UTEP's acceptable-use policy. A recording of class sessions will be kept and stored by UTEP, in accordance with FERPA and UTEP policies. Your instructor will not share the recordings of your class activities outside of course participants, which include your fellow students, teaching assistants, or graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. You may not share recordings outside of this course. Doing so may result in disciplinary action.

Learning Modules

This course is designed using a modular format—that is, each week is “packaged” as a single module so that all the materials, videos, and submission areas are in one area for a given week. Each week, generally sometime on Friday, a new course Module will be posted on Blackboard. This module will have a reading assignment (generally two sections per week); links to related videos (which won't be posted until after the Tuesday class discussion); links to discussion board questions; and links to homework assignments.

Course Assignments and Grading

Discussion questions (10%)

Each week, the course discussion boards will have a few questions for you to answer, based on the reading, the class activity, and videos. Most of the discussion questions will be posted on discussion boards for smaller groups (about 6 students), but one question each week will be on a discussion board for the whole class. I will form these groups after the first week of class, based on some introductory activities that will help you get to know your fellow classmates. I will also change the groups about midway through the semester, so you can get to know other classmates.

For full credit, answer each discussion question by Thursday evening, 11:59pm, and also respond to at least one other classmate by Friday evening, 11:59pm. Do not simply repeat answers (or responses); if someone else has already said what you were going to say, think of a way to extend or expand upon what the first person said.

Discussion rubric: At the end of the semester, I will evaluate your overall contribution to the course on the discussion boards according to the following rubric.

- A: Mathematically valid statements that address the question and are supported by references to the textbook. Clear, well-organized writing. Replies to other students are helpful and related to their original posts. Focused questions when you are confused. Overall, your posts help advance the learning of the whole class.
- B: Mostly mathematically valid statements that address the question. Clear writing. Replies to other students build on their original posts, and are sometimes helpful. Questions when you are confused.
- C: Mathematically reasonable statements that are related to the question, and that show a serious attempt to understand material. Understandable writing. Replies to other students that are related to their original post. Questions when you are confused.
- D: Some attempt to address the questions. Decipherable writing. Questions when you are confused.

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.

Netiquette: Our conversations on the discussion board will be governed by the following important principles.

- Always consider audience. Remember that members of the class and the instructor will be reading any postings.
- Respect and courtesy must be provided to classmates and to instructor at all times. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a F2F situation.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible

website, blog, or other space. If students wish to do so, they have the ethical obligation to first request the permission of the writer(s).

Homework (20%)

Weekly written homework will generally be due by 11:59pm on Sunday. Be sure to write your solutions clearly, using complete sentences, showing your calculations, etc. For homework, you may consult with various sources for general help with any problem, but you must solve the particular problem by yourself. Sources you may consult include: classmates; friends, tutors; any material from the class, including the textbook or class videos; online books and videos. **If you consult any sources outside of the class, you must let me know which sources you used** (a short message, by email or within Blackboard, will suffice).

Your lowest homework score will be dropped.

Class presentation (20% each)

There groups of students will design and conduct all classroom activities for one class session and will be responsible for the content covered in those sessions. Each group will also create homework assignments. To accommodate this, **during the last three weeks of class, we will also meet Thursdays, 2:00-2:50.**

Final project (20% each)

There are mathematics problems that require more attention than just one day. Near the end of the semester, I will give you a list of such problems. Small student groups will choose one of these problems to solve and present the results in a written report, and in a video presentation (live or recorded) during our scheduled final exam period, **Thursday, May 13, 1:00-3:45.**

Exams (15% each)

There will be two exams throughout the semester.

- Exam 1, Thursday, February 25
- Exam 2, Thursday, April 15

Each exam will cover material from the beginning of the semester, though the second exam will focus more on material since the first exam. Each exam will last 90 minutes (the usual 80 minutes and an extra 10 minutes to make sure you have enough time to upload your work). You may start the exam as early as 12:00am, and as late as 11:59pm, on the designated day. There will be no final exam, but note the final project presentation scheduled during finals week, above.

For exams, you may consult only with any notes you took during class, the textbook, and class videos. No other sources are allowed. You may not consult with any person.

Grading scale

All graded items will be graded on, or 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.

Alternative means of submitting work in case of technical issues

I strongly suggest that you submit your work with plenty of time to spare in the event that you have a technical issue with the course website, network, and/or your computer. I also suggest you save all your work (discussion posts, homework, and exams) in a separate document as a back-up. This way, you will have evidence that you completed the work and will not lose credit. If you are experiencing difficulties submitting your work through the course website, please contact the UTEP Help Desk. You can email me your back-up document as a last resort.

Drop Policy

To drop this class, please contact the [Registrar's Office](#) to initiate the drop process, by the deadline of Thursday, April 1. 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.

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.

Accommodations Policy

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. If you have, or suspect you have, a disability and need an accommodation, you should contact [UTEP Center for Accommodations and Support Services \(CASS\)](#) at (915)747-5148 or cass@utep.edu, or apply for accommodations online via the [CASS portal](#). You are responsible for presenting to me any CASS accommodation letters and instructions.

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](#).

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.
- [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.
- The [Student Success Helpdesk](#) understands that juggling life and school can be difficult. They have a team dedicated to providing students with support for challenges such as: financial literacy; paying for college; and food, housing, and transportation resources.

COVID-19 Precautions

Even though our course is meeting entirely online, it benefits the entire UTEP community if we are all aware of the following precautions.

You must STAY AT HOME and REPORT if you (1) have been diagnosed with COVID-19, (2) are experiencing COVID-19 symptoms, or (3) have had recent contact with a person who has received a positive coronavirus test. Reports should be made at screening.utep.edu. If you know of anyone who should report any of

these three criteria, you should encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to COVIDaction@utep.edu.

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website (screening.utep.edu) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to campus when feeling ill or exhibiting any of the known COVID-19 symptoms. Students are advised to minimize the number of encounters with others to avoid infection.