

MATH 4303: Fundamentals of Mathematics from Advanced Standpoint

CRN: 23049

Spring 2023

Liberal Arts, room 207

Tuesdays, Thursdays, 3:00-4:20

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.

(915)545-1788/home: 9am-9pm only, please.

Internet: adual@utep.edu,

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

Office hours:

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

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 <http://tinyurl.com/ArtDuvalSpring23> 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 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 relations and functions, and especially inverse functions; exponential and logarithmic functions; and the algebra of polynomials, including roots and factors.

Required Materials

Mathematics of Doing, Understanding, Learning, and Educating Secondary Schools MODULE(S^2): Algebra for Secondary Mathematics Teaching This is a coherent package of course materials carefully developed by a cohort of colleges funded by the National Science Foundation, for classes just like this one. The materials provide opportunities for users to develop deep mathematical knowledge of mathematics, specifically as it relates to doing the work of teaching. I will be supplying the “book” as .pdf files to you as we move along. So, there is no textbook to buy, and there is no cost for the materials.

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 this term, which allows us to provide fast and accurate feedback on your work. Written assignments 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 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 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.)

Video recording: For a few assignments (details below), you will need to record yourself presenting a brief lesson. A cell phone or tablet should be sufficient. It is also possible to borrow video recording equipment (and other technology equipment) [from the UTEP Library](#).

Course Assignments and Grading

Participation (5%)

Your active participation in class is essential to the success of everyone in the class: yourself and your classmates. Active participation does not mean always knowing the correct answer, but it does mean helping the conversation forward with your ideas and your feedback on others' ideas, including sharing any confusion you may be having.

Written Homework (25%)

Written homework will be assigned approximately weekly, and announced in class and on Blackboard and Gradescope. Assignments will generally be due Sunday evenings 11:59 p.m. These solutions should be written clearly and completely. Your lowest homework score will be dropped.

For homework, I encourage you to work with your classmates. You may also consult with various other 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 handouts from class; 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).

Written Simulation of Practice (15%)

You will be given a task and asked to design and envision a task-based classroom discussion. You will address both the mathematics of the situation and the students' thinking about the mathematics. There will be 2-3 of these assignments through the semester. Each paper should be a 1-2 pages long.

Video Simulation of Practice (15%)

You will videotape yourself responding as a teacher to hypothetical statements by students. You will address both the mathematics of the situation and the students' thinking about the mathematics. There will be 2-3 of these assignments through the semester. Each video should only be a few minutes long.

Exams

Midterm exam (15%) The midterm exam will cover all material up to that point. It will be in class, on **Thursday, March 23**.

Final exam (25%) The final exam will be comprehensive over all material of the course. The final will be on **Thursday, May 11, 4:00 – 6:45 p.m.**

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.

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 for each type of homework 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

I strongly encourage you to attend every class you can (but stay home if you are sick), though there is no particular grade penalty for absences. You are responsible to find out any assignment that must be made up if you are absent. My goal is for class meetings and activities to complement, rather than echo, the textbook, and thus for every class to be worth attending.

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](#).

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.

Drop Policy

To drop this class, please contact the [Registrar's Office](#) to initiate the drop process, by the deadline of **Thursday, March 30, 2023**. 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](#) 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.

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.

COVID-19 Precautions

If you are sick, stay home! Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to covidaction@utep.edu, so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID-19 testing (see below).

Vaccines. The best way that Miners can take care of Miners is to get the vaccine, which is now widely available for free in the El Paso area. Learn more at epcovidvaccine.com.

Testing. UTEP is offering two convenient options for free COVID-19 testing on campus. For more details, see <https://www.utep.edu/ehs/covid/>.

Current UTEP students have access to **free on-campus testing in the UTEP Student Health and Wellness Center** located in Union Building East, first floor. No appointment is necessary, although preregistration online is required at medicatconnect.com. Click [here](#) for more information about student on-campus testing at UTEP

The University also offers **free self-administered COVID-19 PCR testing through a kiosk located at the UTEP Testing Site at 3333 N. Mesa**. The kiosk is located outside the building's entrance, and it is available 24 hours a day, seven days a week. Register online at <https://register.testandgo.com/> or access the registration app by scanning the QR code at the machine.