

MATH 5370: Algebraic Structures

CRN: 28075

Spring 2022

Bell Hall, room 130A, Tuesdays, 6:30-7:50

Online, Thursdays, 6:30-7:50

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.

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

Internet: adual@utep.edu,

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

Office hours:

- Mondays, 10:00-11:00
- Tuesdays, 2:00-3:00
- Wednesdays, 4:30-5:30
- 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 <http://tinyurl.com/ArtDuvalSpring22> 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.

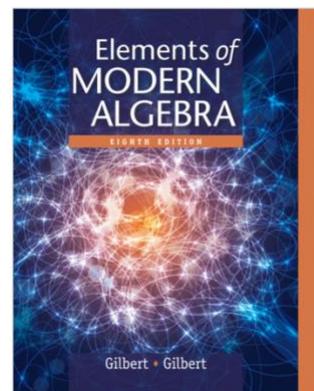
Prerequisite: Principles of Mathematics (MATH 3325) or equivalent

In particular, I will assume that you are comfortable reading and writing rigorous mathematical proofs.



Course Objectives

Upon successful completion of this course, you will be able to rigorously justify and explain the results and techniques from elementary algebra that show up in the standard high school algebra curriculum. You will be able to use fields, rings, and groups to analyze objects including polynomial rings, the ring of integers, the fields of real and complex numbers, and other structures from the high school curriculum. Additionally, you will increase your ability to think mathematically.



Required Materials

Textbook: *Elements of Modern Algebra, Linda Gilbert, 8th ed.* We will discuss Chapters 3-8. You can find more information about the textbook at the publisher's website <https://www.cengage.com/c/elements-of-modern-algebra-8e-gilbert/9780357671139/>

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.

Zoom: Thursdays' class meetings will be held on Zoom. Additionally, you can attend office hours (scheduled or by appointment) 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. 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, 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.)

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 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.

Communication: To meaningfully participate in Thursdays' online class meetings, 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.

Class Recordings

Thursday class meetings will be recorded, and then posted on Blackboard the next day. The use of recordings will enable you to have access to a class meeting 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.

Course Assignments and Grading

Participation (10%)

Your active participation in class is necessary for the success of both you and your classmates. This participation will take many forms: Thursdays will generally be centered on introducing new material, when you will need to work in class on new problems whose solutions will provoke the need for new ideas. But you will also need to actively question new definitions and theorems I introduce, work with the class on proofs to theorems, and work with classmates on solutions to examples.

Tuesdays will generally be centered on reviewing ideas from the previous Thursday, including your presentations 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 create sound mathematics. Sometimes a good question is more valuable than a correct answer.

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.

- A: Insightful contributions to class discussions that move the conversation forward; clear, correct presentations to problems; helpful audience participation, including appropriate feedback and good questions.
- B: Active participation in class discussions; correct presentations to problems; good questions and suggestions during audience participation.
- C: Responsive participation in class discussions; reasonable presentations to problems; asking questions when you are confused.
- D: 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.

Weekly Homework (30%)

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 notes; 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 score of the semester will be dropped.

Connection Assignments (10%)

There will be three assignments through the semester where you find the connections between the material we have recently been seeing in class and the material in the high school curriculum. More details will be available as we get closer to the first assignment.

Exams

There will be two exams. Both 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.

Midterm Exam (20%)

The midterm will cover all material we have discussed to that point. It will be on **Tuesday, March 1, in class.**

Final Exam (30%)

The final exam will be comprehensive over all material we discuss in class. It will be on **Thursday, May 12, 7:00 p.m. – 9:45 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 both 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:

- [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 Friday, April 1, 2022. 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.

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. The city of El Paso is administering vaccine booster shots Wednesdays and Thursdays the first two weeks of the semester (January 19, 20, 26, 27), at the Undergraduate Learning Center. Learn more at epcovidvaccine.com.

Masks. At our current level of disease in El Paso, the Centers for Disease Control and Prevention (CDC) recommends masks for everyone (vaccinated or not) while indoors in a public setting.

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

UTEP is providing free walk-up COVID-19 testing for students, faculty, and staff from **9 a.m. to 2 p.m. Monday through Thursday in the University's former Honors House, behind the Academic Advising Center.**

Students, employees and the general public can pull up to the City of El Paso's COVID-19 Mega-Testing Site on UTEP property at **3333 N. Mesa at Kern Drive**. This public site includes two dedicated priority lanes for Miners and their household members, as well as lanes for the general public.

Current UTEP students also have access to **free on-campus testing in the UTEP Student Health and Wellness Center** located in Union Building East, first floor.