Changes may be made to this document, and to linked pages or files, before the semester starts. Links on some pages may not work at all before Jan. 8.

Syllabus and course information

MAS 4301 — Abstract Algebra 1
Section 075A (14554), Spring 2024
MWF 4th period (10:40-11:30), Little 219

Link to class home page

- UF Health and Wellness Resources
- Goals of course

Prerequisites: a grade of C or better in MAS 4105 (Linear Algebra 1), or a grade of B or better in MHF 3202

Textbook: Joseph A. Gallian, *Contemporary Abstract Algebra,* 9th edition (2017)

Syllabus (course content): An introduction to the theory of groups and rings. General topics will include:

- definition, examples, and elementary properties of groups;
- general finite groups and their subgroups; cosets; Lagrange's Theorem;
- permutation groups;
- isomorphisms and general homomorphisms;
- direct products;
- normal subgroups; quotient groups (a.k.a. factor groups);
- definition, examples, and elementary properties of rings (time permitting)

***Tentative, approximate* weekly schedule of lectures.** Click here. You should be reading the textbook *regularly*, keeping *ahead* of where we are in class. At worst, for material covered in class, you are expected to read the relevant pages of the textbook no later than one day after we cover that material in class. You may sometimes be assigned to read material that we don't have time to cover in class. This material should be read by whatever due-date for that reading is given on the homework page.

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Communicating with Dr. Groisser outside class

For anything that needs a response, the primary way to communicate with me outside class is to **see me in office hours**. The circumstances in which you may communicate with me by email are **limited**; see "Emailing me" below.

- **Office Hours:** Tentatively, Monday 5th period (11:45-12:35), Wednesday 6th period (12:50-1:40), and Friday 6th period (12:50-1:40). My office is Little Hall 308.
  *I may **require** you to wear a mask at all times in my office,* since Little 308 is a small, poorly ventilated room in which I spend most of my workday.

See also the statement concerning office hours in the attendance policy.

Both for in-person and virtual office hours, please arrive early in the period or let me know to expect you later; otherwise I may not stay in my office or at my computer for the whole period.

If you have the flu or similar contagious disease, or think you might, please do not come to my office. If you need to speak with me at such a time, we can set up a virtual meeting.

Students who can't make **any** of my scheduled office hours may see me by appointment on most weekdays (but ***never on a Thursday***). See Scheduling appointments with Dr. Groisser outside office-hours, later in this document.

- **Emailing me.**

I receive a ton of email, and replying is very time-consuming, so please be aware of the following:

- **THE EXISTENCE OF EMAIL DOES NOT EXTEND MY OFFICE HOURS.**
  For student emails that deserve individual replies, in general I reply **only during my next office hour** or as soon thereafter as I can. (As stated above, "The existence of email does not extend my office hours.")
  Students who email me a question on a day I have an office hour, and don't explain why they're emailing me instead of attending my office hour, should not expect a response.

- **EMAIL IS NOT A SUBSTITUTE FOR SEEING ME IN OFFICE HOURS.**

- **I don't answer email that lacks an *informative* subject line and the sender's full name.** Students should also state **which of my classes they're in** (but this may be done in the body of the email rather than the subject line).

- **I will not answer math questions by email.** An interactive conversation is needed.

- **There are many non-math questions that I won't answer by email either.** In particular, I usually won't respond to email that asks questions that have already been answered in items you should have read (for example: this syllabus, the class home page, homework page(s), solutions handouts, emails I've sent to the class, and announcements I've posted in Canvas), or that were answered in a lecture or discussion that the student *elected* to miss for unapproved reasons, or that should be (or should have been) asked in office hours.

- For student emails that deserve individual replies, in general I reply **only during my next office hour** or as soon thereafter as I can. (As stated earlier, "The existence of email does not extend my office hours.") Students who email me a question on a day I have an office hour, and don't explain why they're emailing me instead of attending my office hour, should not expect a response.

- I don't provide individualized grade information by email.

- I won't open attachments (or follow links) that look suspicious to me. I generally delete, without fully reading, any email that contains these.

- My email address is located here.

Some examples of email-content that would be **okay** to send me are:

- "The link for [this item] on [this page] seems to be broken [or: takes me to the wrong page]."
- "I think there's a typo in the homework assignment. You listed exercise 1.2/3g, but exercise 1.2/3 doesn't have a part (g). Would you please clarify what you intended to assign?"
  For clarifications to homework assignments, I'll usually take action ASAP after seeing your message. But once I'm done with my fix, I may only send the entire class message about the update (or post one), rather than replying to the individual student(s) who notified me of the problem.
- "I'm planning on coming to your office hour tomorrow, but I can't get there till 30 minutes after it starts. I just wanted to let you know to expect me late."
- "I won't be in class on such-and-such date, for such-and-such reason."
- "I'm applying for a summer program [or scholarship, graduate school, etc.]. Would you be willing to write a letter of recommendation for me? The deadline is [month/day]."

- **Communications *from* me.** You are required to read fully, and reasonably promptly, any communications from me. These communications include, but may not be limited to, emails (either to the class listserv or to you personally) and announcements on Canvas.

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Graded components of course. Your final grade will be determined by:

- Two midterms (hour exams), each counting for 20% of final grade.
- A cumulative final exam, counting for 30% of final grade.
- Handed-in homework, totaling 30% of final grade.

I reserve the right to adjust the above percentages in individual cases, to a student's benefit, if I feel that circumstances warrant. **I will not answer any questions about hypothetical situations in which I might do this.**

- **Exams**

  On any exam: unless I say otherwise, you are responsible for knowing any material I cover in class, any subject covered in homework, and all the material in the textbook sections we've covered or you've been assigned to read. You will do best if, after every lecture, you review and study as if you're having an exam on that topic the next day. **One of the surest ways to do poorly, at least in my class, is to put off studying until shortly before an exam.** Exam-preparation is something you do all semester long by **keeping up with the lectures and homework**.

  - **Midterm exams.** The *tentative* dates of the midterms are Fri., Feb. 9 and Fri., Mar. 22. *These dates are subject to change*. The actual dates will depend on our rate of progress. I will give you at least a week's notice before any exam. **Do not, under any circumstances, use these tentative exam-dates as a guide to plan dates that you think you do not "need" to be in class, e.g. if you are thinking of being out of town on any days that are not UF holidays.** (See "Attendance Policy" and "What if you miss an exam?" below.) **Expect a grade of 0 on an exam that you miss because you planned to be out of town on the date that the exam ends up being given. This includes the day before spring break!**

  - **Final exam.** This will be a two-hour exam given Thurs. May 2. As of this writing (Jan. 1), it will be held in our usual classroom starting at 7:30 **a.m.** (the time-slot that the Registrar has assigned us). Personally, I consider 7:30 a.m. a ridiculously early hour for a final exam. After Drop/Add is over and students know when all their *other* final exams will be, I can request that the Registrar give us a later hour if that wouldn't cause an exam-conflict for anyone.

  Questions about the *scoring* of any midterm (or homework assignment) must be brought to me within a week of the day I return that graded item to the class (whether or not you were present that day).

- **Homework:** I will be assigning homework several times a week, but collecting it only about six to eight times (due-dates TBD). Thus, each numbered assignment will have exercises (and reading) that were assigned over roughly a two-week period. When I start posting problems (on the homework page) for an assignment, you'll often see wording like "Assignment X (not yet complete)"; I remove the "(not yet complete)" once everything for that assignment is posted. I often wait until we've covered certain material to post certain problems, to avoid misleading you into thinking you already ought to be able to do problems you actually don't yet have the tools for.

  You should start on each homework problem **within a day of its appearance on the homework page**. This will entail working on homework *several days a week*, not just on one weekly "abstract-algebra homework day" that you designate.

I will collect only a (proper) subset of the assigned exercises. **This does not mean that the uncollected exercises are optional.** No portion of homework is optional unless I label it as such. **To learn mathematics, you need to *do* a lot more exercises than anyone has time to grade.** A sure way to get a poor grade in my class is to work on only the exercises I have you hand in. **It is impossible to overstate the importance of doing** (or at least attempting) ***all* the homework.**

You may not be able to *solve* 100% of the problems, but you need to *try*. Often, a difficulty you may have with a homework problem is something that I would be able to help you surmount in an office hour. The earlier you start working on an assignment, the greater the chance that you'll get to see me in office hours before the assignment is due.

To help discourage you from the temptation to wait until the hand-in problems are announced before you start working on a given assignment's exercises, I may not announce which exercise I'm collecting until shortly before they are due.

Your graded work will usually, for most students, have corrections and/or comments on it. **It is EXCEEDINGLY important that you read all of these *promptly*, and make sure you understand them** (or ask either the TA or me to explain any of these that you don't understand). This should be done **before you start writing up the next assignment you're handing in, or before the next exam, whichever comes first.** Writing mathematics, especially proofs, is a large component of this course. You are expected to **improve** in this as the semester moves along. Once a mistake has been corrected on one of your assignments or exams, I should not see the same type of mistake in your future work (or at least I should see it less and less often). Proof-writing mistakes that cost you only a few, if any, points early in the semester, will be more costly later in the semester.

I may sometimes post (or give you) handouts that address misunderstandings or mistakes that are affecting more than one or two students. **It is important that you read any such handout *promptly and thoroughly*, whether or not you think you're in the target audience.**

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Importance of following rules and instructions

The homework page has various important rules, including what's become a long list of rules about the format of submitted work. There has always been just one simple principle behind all those rules: *Don't make your work harder than necessary for me to read or to comment on.* Said another way: *Have respect for my time, and use common sense.* Unfortunately, what I mean by this has proven not to be obvious to students, leading to an ever-growing list of explicit "do"s and "don't"s.

I have learned by experience that, unfortunately, in *any* class, a significant number of students will not take a rule seriously unless *and until* there is a penalty for violating it. Consequently, *I no longer have a grace-period during which I do not enforce my rules. Do not pick and choose which of my rules to follow. Non-observance of any of these rules, startig with the first hand-in assignment, will earn penalties that could lower your grade.*

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Some advice on how to do well

To quote from the linear-algebra textbook by Friedberg, Insel, and Spence (which you may have used in MAS 4105):

> **"*Each* new lesson usually introduces several important concepts or definitions that must be learned in order for subsequent sections to be understood. As a result, falling behind in your study by even a single day prevents you from understanding the material that follows. To be successful, you must learn the new material as it arises and *not wait to study until you are less busy or an exam is imminent*."**

You'll find what amounts to additional advice (not always explicitly labeled as such) in several sections of this syllabus (and on the homework page).

A great many students don't do as well as they'd hoped, for reasons that can be chalked up to *not following their instructors' best advice from the start.* Much of my advice will require more time, and more consistent effort, than you're used to putting into your classes. It's easy to dig yourself into a hole by thinking, "I've never had to work after every single class, or put in as many hours as following advice like this would take, and I've always done well. And the same goes for my friends. So I'll just continue to approach my math classes the way I've always done." **By the time a student realizes that this plan isn't working, and asks his or her professor "What can I do to improve?" it's usually too late to make a big difference.**

Further general advice (for almost any math class)

- **Come to every class and take good notes.** (See my handout "Taking and Using Notes in a College Math Class", part of the first homework assignment for your class.) In a typical semester, a typical student will *need* to miss no more than about two days of class per semester. (Here, "need" means illness, medical emergency, etc. There can be significant, valid variations from what's "typical", of course; e.g. some medical emergencies could put a student in the hospital for a week or more.) **More than three absences over the course of a semester is a lot; more than four is excessive.** In any lecture, the key nuggets of insight—the ones that could help turn a light-bulb on for you—might be in just one or two sentences. These can't be repeated endlessly within a lecture, or in several lectures, for the sake of students who were absent or were not paying attention; there isn't the time. The more lectures you miss, and the less careful attention you pay, the more the important info you're likely to miss. But you've got to own the responsibility for knowing everything that was said in class.

- **Do 100% of assigned homework** (as mentioned earlier), whether or not you're required to hand anything in, and whether or not that 100% includes reading as well as exercises. Don't make the mistake of thinking, "Oh, that 100% is just for students who are set on getting an A." No. **That 100% is for students who want to get a C or better.** "C" means satisfactory, and there is nothing satisfactory about doing less homework than you've been assigned.

  If ever you can't complete a homework assignment by the listed due-date, then complete the assignment as soon as *possible* (not just "as soon as *convenient*") thereafter—and **without falling behind on any new homework.** This may require spending more time on schoolwork than you're accustomed to. Don't put yourself in the position, by choice of how many hours you spend on schoolwork, of making "as soon as possible" become some nebulous "whenever" date in the future; as you probably know, you won't end up not completing the assignment.

- Study **from day one** as if your next exam is next week. In addition to doing your assigned homework, study your notes after every lecture, making sure that there's nothing you don't understand. (If there *is* something you don't understand, come to your instructor's or TA's next office hour.) If you put yourself in the position of having to learn a whole topic, or re-learn it because you've forgotten too much (which can easily happen if you've done less than 100% of your assigned homework), there's not going to be enough time for you to fully prepare yourself for your final exam.

- When studying for any exam, **your goal should be for you to be able to get 100% on the exam *no matter what is asked***. Don't try to *game* the exam, attempting to guess what questions are likely to be on it. Never put yourself in the position of "I think that if I know X, Y, and Z, that should be enough for me to get an A/B/C." **That is a losing strategy.** You might luck out on some exam(s), but much more likely is that you will know less than needed for the grade you hoped to get.

- Finally, **when doing schoolwork, don't multi-task**. https://news.stanford.edu/2009/08/24/multitask-research-study-082409/

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Attendance policy

- As UF has advised, **students with a contagious illness (or reasonable suspicion of one) should not come to class.**

- *Healthy* students are expected to attend **every** lecture and discussion, barring such things as family emergencies, weddings, funerals, UF-sanctioned extracurricular activities, and religious holidays (see below). Potentially excusable absences that you know about in advance will not be treated as excused unless you inform me of them in advance.

  I expect students to arrive *on time* and to pay attention for all 50 minutes of the period. In most classrooms, arriving late is disruptive (as is leaving early). If a non-optional time commitment (e.g. a class the previous period in a distant location) will force you to be late on a regular basis, let me know at the start of the semester.

- **Religious Holidays.** The following is part of the University of Florida Policy on Religious Holidays. "Students, **upon prior notification of their instructors**, shall be excused from class or other scheduled academic activity to observe a religious holy day of their faith."

- **Students who *choose* (for reasons other than those of the types above) not to attend class regularly are *forfeiting the right to my help in office hours,* including explanations of their mistakes on homework and exams.** These students should also not expect replies to their emails, even for questions like "Is there an exam tomorrow?" or "Have you decided when the next exam will be?" Also be aware that the University of Florida Attendance Policies contain the following paragraph:

  > *The university recognizes the right of the individual professor to make attendance mandatory. After due warning, professors may prohibit further attendance and subsequently assign a failing grade for excessive absences.*

  I am giving you now your due warning that I may prohibit further attendance and subsequently assign a failing grade for excessive absences. I reserve the right to impose a less extreme penalty instead.

- If you are absent from lecture or discussion, for any reason, you should obtain *written* notes from a classmate. (**Students are *not* permitted to share their own *recordings* of lectures with each other,** if they make any such recordings. See In-class recording by students below.)

- If you miss class the day I return an exam or homework, you'll have to pick up your exam or homework from my office. I expect you to do this within a week (unless you are ill or quarantining); I will not hold onto your exam indefinitely. The same is true of any handouts that you missed receiving in class.

Classroom decorum:

- Reading the newspaper, reading messages on your phone, looking at your computer, talking, texting, etc., are rude and disruptive. **No electronic devices are to be used in class without explicit permission from me.** If you generally take notes by writing in a tablet, see me to get permission. I may ask at any time to see what notes you've taken.

- Please avoid disruptive or distracting noises, such as the tapping of pencils or feet, or the zipping or unzipping of backpacks several minutes before the end of class.

What if you miss an exam?

If you miss an exam for a valid reason, and supply me with satisfactory documentation *promptly*, I will work out with you some way that is as fair as is feasible for you to make up the missing grade-component. Except in very large classes (which I don't teach) with cookie-cutter exams (which I don't give), there is no such thing as an equitable make-up exam. Thus, the way I have you make up the missing grade-component may or may not be via an exam. If you miss an exam for a reason that I do not consider valid (consistent with UF policy on which absences should be excused), or do not supply me with satisfactory documentation within two days, you should expect to receive a zero for that exam. If extenuating circumstances cause a reasonable delay in your providing me with satisfactory documentation, I may treat your exam-absence as valid and documented. (However, I will be the sole judge of what is "satisfactory", "extenuating", and "reasonable".)

If you are too ill to take an exam, please notify me by email before the exam starts (if possible).

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Cheating

Student Honor Code. UF students are bound by The Honor Pledge, which states:

> We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

The Honor Code, which can be found here, specifies a number of behaviors that are in violation of this code. As stated at the given link,

> ***Cheating*** *includes but is not limited to:*
>
> - *Using any materials or resources prepared by another Student without the other Student's express Consent* ***or*** *without proper attribution to the other Student.*
> - *Using* ***any*** *materials or resources,* ***through any medium,*** *which the Faculty has not given* ***express*** *permission to use and that may confer an academic benefit to the Student.*
> - *...*
> - *Collaborating with another person,* ***through any medium,*** *on* ***any*** *academic activity, when Faculty has expressly prohibited collaboration.*

In addition, students are obligated to report to appropriate personnel any condition that facilitates academic misconduct.

The "You cheat, you fail" rule: In my class, the penalty for cheating on hand-in assignments is, almost always, a failing grade (E) for the course (if the student doesn't drop). I will not tolerate students who take advantage either of their classmates or of me, causing me to waste time on police-work. If you cheat, do not expect a second chance from me.

If you're going to be tempted to use unauthorized sources when doing hand-in homework, you're going to be very uncomfortable in my class. Cheating on hand-in homework, through the use of unauthorized sources, has been the downfall of many of my students the last few years.

Some truths that students in my class will need to accept are:

- **Your need or want for a certain grade does not entitle you to that grade,** even if you've never gotten a lower grade in the past.
- **You learn more by struggling with a problem unsuccessfully for hours, and having it rattling around in your brain for days, than by looking at someone else's solution.**
- **Not all students will be able to solve all assigned homework problems.** Not all students *should* be able to solve all assigned problems. Students are not all equally strong at mathematics, and some assigned problems are intentionally challenging. It is not a terrible thing if the best students have some opportunities to solve problems that their peers can't solve. Being unable to solve a problem is never an excuse for cheating.
- If you can't do a hand-in homework problem successfully on your own (using only authorized sources, which include consultation with me or your TA), **you shouldn't get credit for it**—whether that's the situation with just one problem or with practically every problem on an assignment. This is true **regardless of the impact on your grade.**
  If you can't figure out how to do a homework problem that you've been asked to hand in, the right thing to do is **not to hand it in** (or to hand in only the parts you *do* think you did successfully). **It is never right to hand in someone else's work as if it were your own, or to get unauthorized help.** These things ***are* real cheating,** no matter how common they are, and whether or not you've done them before. They are *not* victimless crimes.

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My grading system for this course

1. After each homework or exam, I decide grade cutoffs for that item according to the philosophy "A = excellent, B = good, C = satisfactory, D = unsatisfactory but passing". In setting these cutoffs, *I do not have a predetermined grade curve or predetermined percentages for letter grades.*

2. At the end of the semester, I compute a numerical "raw score" for each student, on a 1000 point scale, using the weighting scheme stated earlier: 20% (200 points) for each midterm, 30% (300 points) for the final exam, 30% (300 points) for the homework.

   On the exams themselves, you'll see point-totals different from the ones above. These are rescaled appropriately in the raw-score computation. For example, if point-values for the problems on the first midterm add up to 138, your exam score will be multiplied by 200/138 in the above computation.

   Similarly, the homework assignments will not all be the same length and will not all count equally; they will count proportionally to the number of points in each assignment. For example, if the point-values of the homework assignments add up to 249, then your homework-point total will be

multiplied by 300/249 in the raw-score computation.

3. By applying the same weighting scheme to the cutoffs for exams and homework, I construct raw-score grade cutoffs for each of the grades A, B, C, D. The cutoffs I use for A- and B+ are the trisection points of the interval from the B cutoff to the A cutoff; the cutoffs for the B-, C+, C-, and D+ grades are computed analogously.

The grades that UF currently allows instructors to assign are A, A–, B+, B, B–, C+, C, C–, D+, D, D–, and E. (**For grade-point equivalencies of these grades, see this catalog page.**) All of these are grades are possible in this class, except the D–.

In my philosophy (and that of my own college professors) of what a minus-grade means, a B–, for example, is *not* the lower end of the B range; it is *somewhat below* the bottom of the B range, and means that your work falls a little short of "good". (Said another way: another professor whose regards your work as "a little short of 'good' ", but who regards B– as meaning "the low end of the 'good' range", would *not* assign you a B– ; he/she would assign you a C+.) This philosophy is consistent with the degree-requirements for most majors at UF: courses count towards your major only if you get a "flat" C or higher, because a C– means that your performance was *less than* satisfactory—not that it was *barely* satisfactory—and therefore that you did not satisfactorily complete the course. This philosophy is also consistent with UF's S-U grade option.

For similar reasons, I have never given the D– grade. "D" means "unsatisfactory but passing". My D cutoff is the rock bottom of what I consider to be the "passing" range, so anything below that is a failing grade, which at UF is the E grade. (*Note*: Because a C is usually needed for a course to count towards requirements for majors, minors, etc., an unfortunate number of faculty, advisors, and students have come to refer to every grade less than C as "failing". *This is not the correct meaning of "failing grade", nor has it ever been;* again see this catalog page.)

Since I don't determine the exam-grade cutoffs ahead of time, I can't tell you in advance exactly how many points you'll need to get a particular grade for the course.

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Scheduling appointments with Dr. Groisser outside office-hours

- Before asking to make an appointment outside of my scheduled office hours, please *make sure you have **first** checked when all my office hours are.* Even though my office hours are *really easy* to find (in this syllabus and on my home webpage), more than half the conversations I have with students who think they can't make my scheduled office hours go something like this:

  Student: "There's something I wanted to ask you about, but I have a class that meets MWF period X" [where period X is the time of, say, my Wednesday office hour that semester].

  Me: "What about my Monday period Y or Friday period Z office hours?"

  Student: "Oh, I didn't realize you had a period Y or period Z office hour. Yes, Monday period Y [or Friday period Z] would work for me. I'll see you then!"

- Scheduling an appointment usually requires some back-and-forth questions about possible and/or convenient times. Usually, coming up to me at the end of class (rather than sending me an email) is the most efficient way to handle this. Email is inefficient for this. But in case you *do* try to handle this by email, here are some do's and don'ts for what to send me:

  "I'd like to meet with you, but I have a conflict with each of the three days/times of each of your three

regular office hours." [So far, so good. Student has indicated awareness that I have office hours at three different days and times, and has not (yet) asked any questions.]

- [**DON'T** WRITE THIS:] "Are you available any other times this week?"
  This is the wrong question to ask by email, even if directly followed by a second question like, "If so, what times could you meet?" The times that are most convenient for me might be times you have a conflict with. If I answer with only those times, we'll need at least one extra round of (avoidable!) back-and-forth emails. To give any answer that could avoid several rounds of back-and-forth email (other than "Speak to me after class"), I have to spend time a lot of time thinking about my answer. Also, I either have to spend time *writing* some sort of preference-order list, or wind up with you choosing a time that's really not convenient but that I put down in case your schedule conflicted with anything else.

- [**DO** WRITE SOMETHING LIKE THIS:] "Here is the full schedule of times I *can't* meet during the week" [followed by a listing of all classes, work conflicts, etc.], or "Here is a list of all the times I *could* possibly meet during the week" [followed by an appropriate list]." It's okay if, **in addition,** you state your preferences among the times that are possible for you. What's **not** okay is stating *only* your preferred times and asking me to choose from among them.

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In-class recording by students

Students are allowed to record video or audio of class **lectures**. However, **the purposes for which these recordings may be used are strictly controlled.** The only allowable purposes are (1) for **personal** educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. **All other purposes are prohibited.** Specifically, students may not publish recorded lectures without the written consent of the instructor.

A class lecture does not include private conversations between students, or between a student and the instructor, that happen to take place during a class session. Recording of these conversations is prohibited.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or **provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student.** Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. **A student who publishes a recording without written consent may be subject to a civil cause of action** instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

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Accommodations for students with disabilities. If you wish to request accommodation for a disability you must first register with the Disability Resource Center. It is always important that you share your accommodation letter with your instructor, and discuss your accommodations, as early as possible in the semester. **"Discuss" does not mean merely "notify"; it means *more* than just having the DRC email me your accommodation letter. Initiating a discussion of your accommodation, is the responsibility of the *student*.**

Teaching-evaluations. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to

give feedback in a professional and respectful manner is available at gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals or via ufl.bluera.com/ufl/. Summaries of course-evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/ .

UF Health and Wellness Resources:

- **U Matter, We Care initiative.** If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit umatter.ufl.edu/ to refer or report a concern, and a team member will reach out to the distressed student.
- **Contact information for the Counseling and Wellness Center.** Visit counseling.ufl.edu/ or call 352-392-1575 for information on crisis services as well as non-crisis services.
- **Student Health Care Center.** Call 352-392-1161 for 24/7 information to help you find the care you need, or visit shcc.ufl.edu/.
- **University Police Department.** Visit police.ufl.edu/ or call 352-392-1111 (or 9-1-1 for emergencies).
- **UF Health Shands Emergency Room / Trauma Center.** For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; ufhealth.org/emergency-room-trauma-center.

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Goals of course:

- For the student to be able to write complete, mathematically correct, grammatically nearly-perfect proofs involving group-theoretic terms and concepts, when such proofs are reasonably straightforward.
- For the student to become more proficient, generally, at communicating mathematical ideas precisely and clearly, in written form.
- For the student to know the meanings and definitions of basic terminology of elementary abstract algebra, including: group; subgroup; cyclic group; abelian group; order of a finite group; order of a (finite-order) element of a group; permutation; even/odd permutation; permutation group; cycle in (a permutation group); cycle decomposition of a permutation; coset; direct product; normal subgroup; factor group (quotient group); homomorphism (of groups); isomorphism (of groups); kernel and image of a homomorphism (of groups); ring
- For the student to
    - know that every permutation has a unique cycle-decomposition and a unique parity;
    - be able to compute the parity of a given permutation;
    - be able to determine whether a given subgroup of a given group is normal;
    - know and be able to prove Lagrange's Theorem on the orders of subgroups of a finite group;
    - know and be able to prove the basic theorems relating normal subgroups and homomorphisms, including the "First Isomorphism Theorem";

- be able, on a timed exam, to come up with proofs of true group-theoretic statements previously not seen by the student, when such statements follow quickly and easily from definitions and theorems that the student is expected to know.

- For the student to be able to produce an example of:
  - a cyclic group of any finite order;
  - an infinite group;
  - two non-isomorphic finite groups of the same order;
  - a finite ring;
  - an infinite ring.

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