

Changes may be made to this document, and linked pages or files, before the semester starts.

Syllabus and course information

**MAA 4402 Section 8436 (15419): Functions of a Complex Variable
and**

**MAA 5404 Section 8442 (15081): Introduction to Complex Variables for
Engineers and Physical Scientists**

MWF 6th period (12:50–1:40), Little 217

[Link to class home page](#)

- [Instructor: Dr. David Groisser](#)
- [Prerequisites](#): Calculus 3 (MAC 2313 or MAC 3474) and Elementary Differential Equations (MAP 2302), each completed with a grade of at least C.
- [Syllabus \(course content\)](#)
 - [Textbook](#)
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Goals of course

Syllabus (course content): This is a first course in complex analysis: the calculus of functions of a complex variable. We will cover most of the material in Chapters 1–7 of the textbook. Topics will include:

- *quick review* of the basic algebraic properties of complex numbers
- complex-differentiability and the Cauchy-Riemann equations
- analytic functions
- harmonic functions
- common elementary functions
- integration
- Cauchy-Goursat theorem
- Cauchy integral formula
- Liouville's Theorem
- Fundamental Theorem of Algebra
- maximum modulus principle
- Taylor Series
- Laurent Series
- residues and poles
- the Residue Theorem
- zeroes of analytic functions
- unique continuation principle
- applications of residues

Textbook: Brown and Churchill, *Complex Variables and Applications*, 9th edition (2014).

Tentative, approximate weekly schedule of lectures. Click [here](#). You are expected to read the relevant material in the appropriate chapter-section of the textbook no later than the day after we cover that material in class.

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Communicating with Dr. Groisser outside class

- **Office Hours:**
 - **In-person office hours:** **Tentatively**, Wednesday 8th period (3:00-3:50) and Friday 9th period (4:05-4:55). My office is Little Hall 308. *I **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.
 - **Virtual office hour:** **Tentatively**, Tuesday 8th period (3:00-3:50). These will be set up as Zoom meetings.

Office-hour days and times are currently tentative because, as of this writing, the meeting-times of various committees and seminars have not been set. I will update this page and [my schedule page](#) if and when my regular office hours change.

For either type of office hour, 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.

Students who can't make scheduled office hours may see me by appointment on most weekdays (but *never on a Thursday*). See also the statement about office hours in the [attendance policy](#).

If you have the flu or similar contagious disease, or think you might, please do not come to my

office.

(This request for common courtesy has been in all my syllabi since Fall 2009; see http://dgarchive.com/classes/3473_f09/syllabus.html#officehrs , for example. There has never been a single complaint about it, and it is not a special request made just for students with COVID-19 symptoms, so I see no valid reason to remove it now. It is also consistent with UF's current policy for attending classes.)

- **Emailing me.**

I receive a ton of email, so please be aware that:

- **EMAIL IS NOT A SUBSTITUTE FOR SEEING ME IN OFFICE HOURS.** I will not answer math questions by email; an interactive conversation is needed.
 - **I don't answer email that lacks an *informative* subject line and the sender's full name.**
 - In general I answer students' emails **only on days that I normally have office hours, and only at certain times.** On office-hour days, I'll generally respond to emails that arrive before the halfway mark of my office hour. *Exception:* I generally don't wait till the next office hour to respond to emails inquiring about (possible) typos in a homework assignment, or informing me of some problem with one of my course webpages.
 - I may not respond to email that asks questions that are 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 should be (or should have been) asked in office hours.
 - 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](#).
- **Communications from me.** You are required to read fully, and reasonably promptly, any communications I send you. This includes, 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:

- **Exams:**
 - **Three one-hour midterms.** **Tentative** dates for these are Sept. 19 (Mon.), Oct. 14 (Fri.), and Nov. 7 (Mon.). **These dates may change**, but I will give you at least a week's notice before each midterm.
 - **Cumulative two-hour final exam**, on Thursday, December 15, starting at 12:30 p.m., in our usual classroom. **Note:** By registering for this section of this course, you are agreeing to be available for an in-person two-hour exam on this date at this time. You are expected to arrange your post-semester travel plans accordingly, and are strongly advised to make those plans NOW. I will have little sympathy for students who state they are "unable" to take the final exam at its scheduled time, or that to do so would pose a hardship. If you voluntarily put yourself in this position, expect a zero for your final-exam score.

On all exams:

- 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 chapters we are studying.
 - *Most* exam problems will be similar to homework, but there may be some problems that you won't have seen a clone of before. Such problems will involve *no new concepts*, but may, for example, combine concepts from different parts of the syllabus, to see if you've achieved a real understanding of the material.
 - MAA 5404 students may be required to answer more questions than MAA 4402 students, or somewhat more difficult questions.
- **Homework:** See the [homework page](#). **You are responsible for checking this page frequently**, since in addition to updated assignments, other important information such as exam dates will be confirmed on this page. (Of course, exam-date changes will also be announced in class well in advance, and more than once.) If miss an exam or do poorly on it because you weren't aware that the date was changed—because you weren't in class when the change was announced *and* you didn't check the homework page for several days, that score (0 if you miss the exam) will still be averaged into your final grade according given weighting scheme.

Homework will be assigned almost daily (on MWF), but, **for now** (the start of the semester), I am not planning to collect it. **THIS COULD CHANGE** if I find that students are not being responsible about keeping up with the homework. **Keep all the homework that you do**, both as proof that you've done it and so that you can use it for review. **At any time, I may ask you to produce, on short notice, all the homework you've done to date.** (And I'll expect it to be on paper, in your handwriting.) **I'll be looking to see that you've seriously attempted every assigned problem.**

It is critical that you not fall behind with the homework. I cannot stress this strongly enough. The reason is *not* to avoid my making the homework more burdensome; rather, I've given you that extra incentive because *students who do not keep up with homework, frequently receive D's or E's (or drop to avoid receiving such a grade).*

I urge you to look at ["Scores grouped by letter grade" for the first midterm and second midterm](#) the first time I taught this course. All the exam questions were examples I'd done in class and/or were identical to, or very similar to, homework questions. (That year, I assigned the same amount of homework I'll be assigning this year, but collected only a small fraction of it. The homework questions that appeared on the exams were, of course, chosen from the ones that I had *not* had the students hand in; it would have been silly to grade the students twice for the same questions.) The scary grade-distributions of the type seen in my 2009 class happen only when a great many students do not do all of the work they've been assigned (which includes not just doing 100% of their homework, but reading their textbook, studying their notes, and reviewing all necessary prerequisite material). Most of the students running D's and E's dropped the class after the second midterm, which is the main reason that the [grade-distribution for the final exam that year](#) was much better.

On most days I will not answer homework questions in class; you should see me in office hours for such questions.

- **For MAA 5404 students only: a short final project**, due near the end of the semester, either on an application of complex analysis to your field of study, or on a topic in the book chapters that we are *not* covering. Discuss potential projects with me early in the semester, since I may want you to consult someone in your home department to get a good idea for your project.

Weights of the grade components:

For students registered in MAA 4402, assuming I do not find that students have been irresponsible about homework, the weightings of the grade-components will be

- 20% for each midterm,
- 40% for final exam,
- 0% for homework.

For students registered in MAA 5404, assuming I do not find that students have been irresponsible about homework, the weightings of the grade-components will be

- 18% for each midterm,
- 36% for final exam,
- 10% for final project,
- 0% for homework.

If I **do** discover that students have not been responsible about doing the homework, I may start collecting and grading it. (See the [homework page](#).) **In this case, the weights given above will change;** the homework weight will go up (from 0%) and the weights of the other components will go down. I have not decided quantitatively what the changes in weights would be, since this would depend on how far along we are in the semester. But the weighting of homework would not exceed 20%.

What if you miss an exam?

If you miss an exam for a valid reason, and supply me with satisfactory documentation *promptly* (which usually means: by your next day back in class), 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 a fair 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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My grading system for this course

1. After each exam or graded homework, 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 given [weighting scheme](#). (So, if a midterm counts towards 20% of the final grade, then it counts for 200 points on the 1000-point scale.)

On the exams themselves, you'll see varying point-totals; exam scores are rescaled appropriately in the raw-score computation. For example, if point-values for the problems on the first midterm add up to 138, and the first midterm counts for 20%, then your exam score (in points) will be multiplied by

200/138 to get your raw-score points for this exam.

A similar principle will apply to graded homework assignments (if any; see [above](#)).

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.

- 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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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.

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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.**
- Much of complex analysis can be learned very well by *diligently* reading a textbook and doing *all* the exercises, so I am not making attendance mandatory. **HOWEVER**, *unless you are confident that you don't need anything I can provide as an instructor*, you should attend every class (barring illness, accidents, weddings, funerals, family emergencies, team activities, religious holidays, etc.). **If you choose not to attend regularly, you forfeit certain rights:**
 - You may not ask questions in class.
 - You may not ask me questions outside of class either. This includes questions about the grading of your exam or homework.
 - The only use you may make of my office hours is to pick up or drop off work, and you may not phone or email me.
 - If I end up requiring that homework be handed in, and your voluntarily absence from class when I taught something relevant to a homework problem causes your work to be more time-consuming for me to read than it ought to be, you may receive a zero for that assignment.

In other words, **if you're regularly an absentee for voluntary reasons, you're on your own**; I will grade your work (except for unnecessarily complicated homework) but will not spend any other time on you.

- For the students who do attend regularly (which I hope will be most of you!), I expect you to arrive *on time* and to pay attention for all 50 minutes of the period. 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.
- 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 injured, ill, or quarantining); I will not hold onto your exam indefinitely. The same is true of any handouts that you missed receiving in class.
- If you miss class, you should obtain *written* notes from a classmate. (**Students are *not* permitted to share their own recordings of lectures with each other**, should they make any such recordings. See [In-class recording by students](#) below.)
- If you miss class the day I return an exam, you'll have one week to pick up your exam up from my office, after which I may discard your paper (unless you arrange with me a day and time in the near future for you to come and pick it up). The same applies to homework.
- **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."

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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.

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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Goal of course: For the student to master the course-content.

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