

Rutgers Math TA Handbook

June 2026

Quick Guide

General Duties

- You are expected to work on TA related duties for an average of 15 hours per week. The average is taken over the duration of the semester.
- You need to check and respond to emails at least daily during the work week.
- You are expected to hold office hours for a total time of at least 80 minutes each week. This is best done in two 60 minute sessions.
- You are expected to be in contact with your instructor about your duties for the course and be prompt in responding to their emails and requests.
- You are expected to prepare for and be present at all of the recitation/workshop sessions you are assigned.
- You are expected to attend and proctor all course exams.
- You are expected to grade all designated components in a timely manner, depending on the course and assignment.

Where to go?

- Textbooks or chalk: Hill 303
- Copy codes: Placed in your mailbox in Hill 315. If you don't have one, contact Colette Claiborne - coleclai@math.rutgers.edu or Hill 334
- To make copies: Hill 315. Swipe access with Rutgers ID outside of normal operating hours. Submit [SAS-IT Workorder](#) if needed.
- Copier or printer paper: Hill 334 - Colette Claiborne - coleclai@math.rutgers.edu
- Rosters: Course Canvas site under People, <https://sims.rutgers.edu/rosters/>, or email ugoffice@math.rutgers.edu if you don't have access
- Building Information: <https://dcs.rutgers.edu/classrooms>
- Schedule information: <https://scheduling.rutgers.edu/>

Types of Assignments

- Workshops: 151, 152, 311, 351
 - Run group-work sessions with a deliverable due a day or two later
 - Grade workshop problems after class
 - Create rubrics for and grade quizzes, if assigned
 - Grade half of all exams and the final
 - May choose problems for workshops and quizzes
- Recitations: 111, 112, 115, 135, 251, 244
 - Run problem-solving sessions each week
 - Create rubrics for and grade quizzes, if assigned
 - Grade half of all exams and the final
- TA-At-Large: 250, 252, 354, 421, 477, 481
 - Grade half of quizzes and exams, including the final

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Teaching in the Rutgers Math Department

There are many different courses that teaching assistants can be assigned to at Rutgers. These courses and a brief description are listed below. The bold letter following the course indicates the type of assignment for the TA: **R** for recitation, **W** for workshop, and **T** for TA-At-Large.

- Math 135 (coordinated, **R**): Calculus 1 class directed at social and life sciences majors. Business majors and pharmacy make up a large component of the course. It covers all of the main topics from Calculus 1 (limits, continuity, derivative, applications, integration, FTC) but in slightly less detail than 151.
- Math 151 (coordinated, **W**): Calculus 1 class directed at engineering and physical science majors. This goes into slightly more detail than the 135 course and has a workshop component. This course includes more types of examples, more integration techniques, and a few other topics.
- Math 152 (coordinated, **W**): Calculus 2 class directed at engineering and physical science majors. The class covers applications of integration, integration techniques, sequences and series, parametrics and polar coordinates, and complex numbers.
- Math 251 (coordinated, **R**): Calculus 3 class directed at engineering and physical science majors. This class covers points and planes in 3D, curves, partial derivatives, multiple integrals, and applications.
- Math 244 (coordinated, **R**): Differential equations class directed at engineering majors. It covers first order equations, second order, a bit of linear algebra, and systems. This course is 4 credits (so it has a recitation) and does **not** have linear algebra as a prerequisite.
- Math 250 (**T**): Introduction to Linear Algebra course discussing the basis of matrix algebra, linear independence, determinants, eigenvalues and eigenvectors, and applications.
- Math 252 (**T**): Differential equations course directed at math majors. This course covers most of the same topics as Math 244, but has linear algebra as a prerequisite, so does not spend time on those topics.
- Math 311 (**W**): Introduction to Real Analysis for Math majors. Most of the students in this class are not going to graduate school (they will also take 411) so the discussions are not too advanced, but the course discusses many of the details of limits, continuity, and differentiation.
- Math 351 (**W**): Introduction to Abstract Algebra for Math majors. Not all math majors need to take this course (they can take a linear algebra version instead). Covers the basics of groups and rings.
- Math 421 (**T**): Advanced Calculus for Engineers. Covers more linear algebra, Laplace transforms, and a bit of PDEs with Fourier Series.
- Math 477 (**T**): Theory of Probability. Covers basics of discrete and continuous probability. Has Math 251 as a prerequisite.
- Math 481 (**T**): Theory of Statistics. Builds on Math 477 into statistical tests and analysis.

Coordinated Courses

Most of the lower level (100 and 200) courses in the math department are coordinated. This means that there is a course coordinator who is responsible for organizing the course and making sure that all of the different sections are roughly equivalent. The goal is that all students with a certain letter grade come out of the different sections equally prepared to move on to the next course, and that no particular instructor is “harder” or “easier” than others.

These courses, in general, have things like

- Common syllabus or schedule of topics
- Common (or similarly structured) midterms and final exam
- Common problems for workshops or activities
- Common assignments

What does this mean as a TA? This means that there are some components of the course that are planned and set up for you. For Math 151 and 152, there is a common workshop bank from which to choose problems for these assignments. For Math 251 and 244, the computational assignments (Matlab, Maple, Geogebra, Desmos, etc.) are common, and will just need to be included in your course.

It also means that your instructor may not have all of the answers to questions. They may need to discuss things with the course coordinator before making a decision, which can mean that you get responses later than anticipated. Also, common exams mean that you may be asked to provide feedback or input well in advance of an exam so that it can be prepared. You may also have to grade at a specific time of the week to provide timely feedback to students. All of this should be discussed by your instructor or the course coordinator at the meetings at the start of the semester.

List of Current Coordinators

Math 135: Joe Guadagni and Sophia Gonet

Math 151 (fall) and Math 152 (spring): Peter Ullman + Malcolm Bowles

Math 152 (fall) and Math 151 (spring): Laurent Vera + Michael Woodbury

Math 251: Mariano Echeverria

Math 244: Corey Stone

Types of Assignments

There are three main types of TA assignments: Workshops, Recitations, and TA At Large.

Workshops

Workshops are mainly used in the introductory calculus courses for engineers and the first proof-based courses for math majors. The main feature of these are the “Workshop Problems” which are designed around students working together in groups to solve them. These can be more advanced problems on the desired topic or highly scaffolded problems to guide students through the thought processes needed to be successful in the course.

A workshop period generally starts with around 10-15 minutes of review of the material. As the workshop instructor, you are not covering material for the first time, but going over topics that the students have already seen in the lecture component of the course. This means that you do not need to go into full detail, and should spend most of this time summarizing the topics from the past week and asking students if they have any questions that you can guide them through. You should feel comfortable doing examples from these topics during this time as well, but be careful to not extend this time too much.

Then, the students will spend the next 40-50 minutes working on the workshop problems for that day. The students will need to be broken up into small groups (3-5 is best) to work on these problems. While they are working, you will cycle around the room, listening in to conversations and guiding students to how to solve them. You should **not** be giving them answers to the problems, but guide them to the correct thought processes to get to the right answer on their own. You should be supportive of the students and encourage them to explore and try to solve the problem.

Depending on the format of the workshop, the students will turn in some portion of the workshop problems. They may be asked to submit all of the problems from the workshop, or just some component of it. The same goes for your grading; you may be asked to grade everything that the students turn in, or just some portion of it. This is something that can be discussed with your instructor if you feel like the workload (for you or your students) is too high. The main goal of your grading here is to make sure that the students can see what they understood in the workshop and didn't, so that they can prepare well for the course exams. In general, the workshops will be due on Canvas or Gradescope one or two days after the workshop period, and feedback needs to be returned to the students (online) **before** the next workshop.

During the workshop, you also want to make sure that everyone stays involved with the problem solving process. Some students will decide to check out and not pay attention until they know what they are turning in at the end of class (assuming you don't tell them until then). You should try to ask those students questions to keep them involved.

In these workshops, you will be working with a Learning Assistant (LA) who is an undergraduate trained in the appropriate pedagogy of these sections. The LA will also cycle the room and help groups throughout the period. You will want to make sure the LA is doing fine, but on the whole, you should be able to trust them to do their job correctly. This trust will get built up over the course of the semester; pay attention to what they are doing early on in the semester to learn if you can leave them to their own devices or if you need to stay more involved.

The goal with this time is to get most (ideally all) of the students through the majority of the problems in the workshop. They may not be able to complete them, but if they have at least started all of the problems and discussed it with their group mates, they will be able to complete the problems to submit later. If students are getting stuck on a problem, or are working out the last details, you can encourage them to hold off on that and try out the other problems first to give them that exposure.

Depending on your instructor, some workshops will end with a quiz. In general, your instructor should write the quiz, but that can be somewhat flexible. You will also be responsible for grading these **before** the following workshop.

Recitations

Recitations vary a lot more in structure than workshops. In workshops, group work is a required component of the class; for recitations, this may or may not be a component of the course. In a recitation, you may be expected to:

- Provide a recap of the course material
- Solve homework or similar problems on the board
- Facilitate the students working in small groups
- Give a quiz

The exact structure of your recitation is something that you should discuss with your instructor before the semester starts, and repeatedly throughout the semester if you notice problems or want to change something about the format.

It is extremely important that you personally review the homework exercises or worksheet in advance of your recitations. Even if the material seems easy on the surface, there might be some nuance that you missed, and that is not something that you want to be discovering during the middle of class. In addition, you want to think about how to present this material and these problems to students who are struggling with it. The topic might be easy for you, but it most certainly will not be for all of your students. And, even if the material seems easy and actually is easy, you will also want to think about how you will present it --- for example, what diagrams to draw to best illustrate what is going on. It is fine for you to consult solutions manuals while preparing. If you are TAing for a course that uses WebAssign or MyLab, you should be able to access a solutions manual through the platform.

Timing is an issue in recitations. In general, you will have to cover the material from two lecture days in a single recitation period, and your time may be reduced by a quiz. This means that you

need to strive for efficiency. A decent rule of thumb is to average one problem covered every ten minutes, though this can vary based on the complexity of problems chosen. Some problems certainly do not take that long, while others may take longer. In conjunction with your lecturer, you should make the decision about which topics to cover in a given recitation. For example, if your recitation is on a Tuesday and lectures are on Mondays and Thursdays, do you cover the material from the Monday and the Thursday of the previous week, or do you go for the Thursday of the previous week and Monday, the day immediately before the recitation? There are arguments to be made either way.

You are encouraged to frequently ask for feedback during your recitation. That is, you should constantly be asking your students if they have questions about what you are doing. As the TA, you want to make students feel as comfortable as possible to ask questions, so try to encourage this. Thank and praise them when they do ask questions. Another good thing to do is to ask your students to participate in the solving of the problems. Questions like ``What's the next step?" or ``What should we do here?"

A decision that you will have to make is whether to personally choose the problems you will want to present to your class, or to solicit them from students. Soliciting them from students has the theoretical advantage in that you will be showing them how to do exactly the problems that they need help with. On the other hand, if you are selecting the problems, you can better craft the flow of your recitation. If you do decide to select them yourself, try to make sure that you hit some of the more difficult questions. If you are soliciting problems from students, be prepared how to handle what happens if you ask for questions and no one volunteers any. (In this case, it is good to have selected some yourself.)

If included, quizzes are usually administered at the end of the class period. In general, your instructor should write the quiz, but that is somewhat flexible. You are responsible for proctoring the quiz, creating a rubric for it, and grading it **before** the following recitation.

TA At Large

A relatively new position in the department is the TA At Large assignment. Historically, a number of mid-level courses (for example, 250 (introductory linear algebra) and 252 (elementary differential equations)) were taught in class sizes of around 40 students. However, increased demand for these courses necessitated an increase in the size of these sections, so that a typical class size for these is now around 85. To assist the lecturer with the logistics of these classes, the position of TA At Large was created. One TA At Large is assigned to two of these large lecture sections.

The main responsibility of the TA At Large is to assist with the proctoring and grading of examinations, as well as grading quizzes. Of course, you are still expected to grade half of the examinations, although this is a heavier grading assignment than usual (due to you being responsible for roughly twice as many students). You may also be responsible for two different courses (and so two different topics to grade for), which can make the assignment a bit more challenging to keep up with.

Department Particulars

Contacts in the Department

- Undergraduate Vice Chair. This is the person in charge of the undergraduate program, and who generally sends out emails to everyone involved in these classes when policies come down from SAS. Email: ugvc@math.rutgers.edu. Currently: Konstantin Mishaikow
- Department Chair. This is the person in charge of the math department as a whole. Any contact here would generally happen after the UGVC. Email: chair@math.rutgers.edu. Currently: Alex Kontorovich
- Undergraduate Advisor. This is a common contact for students who have questions about which classes to take and which classes satisfy requirements for their major. If a student asks questions about this that you don't know the answer to, you can refer them to the math advisor. Email: advisor@math.rutgers.edu. Office: Hill 308. Currently: Melissa Lieberman (Precalc and below), Emily Sergel (Calculus and above)
- Undergraduate Office. This is somewhere that students can go to ask basic questions, and also is where you will go to get textbooks for your classes and can get chalk for your office and classes. If you need to reserve a room for a review session, this is also who you contact. Email: ugoffice@math.rutgers.edu. Office: Hill 303. Currently: Patty Sykes and Phoebe Chu

Copying, the mail room, and textbooks

The copier is available in the mail room, Hill 315. The room is available at all times, but it is locked by a Rutgers ID swipe panel. You will need to have a Rutgers ID card in order to access this room. (It may be open from the elevator side during the work day, but that locks at around 4:00pm. Swipe access is available at all times.) If you do not have a card or your card does not work on the door, submit a work order at <https://cas.rutgers.edu/login?service=https%3A%2F%2Fidps.rutgers.edu%2Fidp%2FAuthn%2FExternal%3Fconversation%3De1s2&entityId=https%3A%2F%2Frutgers.service-now.com> There should be a copy code on an index card in your mailbox in Hill 315. This is the code you will need to use to access the copier. It is recommended that you leave this card in your mailbox so that you will have it there if you forget the number. If you never got one, contact Colette Claiborne (Hill 334, coleclai@math.rutgers.edu).

If the copier is out of paper, you can contact Colette Claiborne (Hill 334) to get more. You should use the copier whenever you need to make copies of a document for class. Do not use the printers to make copies. Print one copy of whatever you need from the printer, and then use one of the copy machines in Hill 315 to make multiples. Printers are located in Hill 601 (computer lab, swipe access), Hill 531 (computer lab, swipe access), and Hill 315 (only printer). You can

print to any of these machines from any of the hard-wired desktop computers in the Hill Center computer labs or offices. You can also use your laptop to print to these printers, see [this page](#). The same copy paper can be used in these printers.

The mail room is also where folders for graders are located. Depending on the course you are involved with, you may be responsible for collecting homework or Maple assignments and placing it in a large envelope in the folder for your sections' grader. After grading (and, perhaps, recording grades in some form --- likely electronically), the grader then typically returns it to the same location for you to pick up and return to your students. (Working out the logistics here usually requires just a bit of electronic communication between you and the grader.) Note that graders only have access to this room between 7:30am and 4:30pm, so you can not expect them to pick up and drop off files outside of this time.

You can obtain a copy of the textbook for your class from the undergraduate office (Hill 303). Please return it at the end of the semester.

Rosters

You can find rosters (complete with photos) for your classes at <http://sims.rutgers.edu/rosters>, or on Canvas under "People". It is a good idea to print these off and bring them to your recitations, as it can help you learn students' names. It can be a good idea to arrive to class early on the first couple of class meetings, greeting students as they arrive. The roster through SIMS also has class photos, so you can identify your students if needed for quizzes or exams.

Make sure to print off new versions of the rosters for each of your first two or three class meetings, as rosters are typically in flux until about a week and a half or so after the semester begins. Throughout the semester, you may want to periodically check the roster for updates. (For example, some students withdraw partway through the semester, taking a grade of "W". If a student disappears from view for a couple of weeks, check to see if they withdrew.)

Advising Questions

Students occasionally will ask you for advice about what courses to take. Learning a bit about the structure of the mathematics curriculum at Rutgers is not a bad idea. For example, knowing that 244 and 252 are both introductory differential equations classes, but the former is designed for engineers, while the latter is for mathematics majors, may help you serve your students better if you find yourself assisting with either course. However, helping students craft their schedules is not really your responsibility. Probably the best thing that you can do is direct them to the undergraduate mathematics advisor, who handles all advising remotely. You can either refer them to advisor@math.rutgers.edu, or send this address an email yourself to ask questions.

Switching recitation sections

On rare occasions, you may find yourself having a one-time conflict with your recitations. (Legitimate reasons may include religious holidays or conferences.) In that case, you should find someone (likely another TA) to cover for you. The best way to do this is to switch sessions ("You cover for me one day, and I'll cover for you one day.") Once you have made arrangements, notify your instructor, along with the undergraduate office.

Things that are not your responsibility

Students may contact you looking for help registering for your class section if it is closed, asking for a "special permission number". You do not have any control over this (in fact, your instructor rarely has any say, either). The best that you can do is to tell them that you have no say in the matter, and direct them to

<https://www.math.rutgers.edu/academics/undergraduate/additional-resources/special-permission-process>.

As a TA, you are expected to work no more than 15 hours per week on average during the semester on your TA responsibilities. This includes scheduled times (primarily recitations/workshops and office hours), as well as time spent preparing for class, along with grading and answering emails related to the class. The 15 hours should be interpreted as an average, as there may be some weeks you go over this limit (this is likely to happen around times of examinations, when their grading becomes an extra responsibility). If you find yourself spending more than 15 hours per week on average, talk with your instructor first about ways to reduce your workload. If it continues to be an issue beyond this, you can contact the department chair or undergraduate vice-chair.

There are many other tasks, outside the ones mentioned above, which it is not appropriate for the course instructor to expect the TA to do, such as writing a rough draft of the examination, or to photocopy the examinations. You should also only be expected to give makeup quizzes during your office hours (you can outside of that time, but your instructor should not require you to do that). If you are being asked to do something by your instructor that you do not believe falls under your responsibilities as a TA, talk to your instructor about it, and if there is still no resolution, you can contact the undergraduate vice-chair.

Observation and Evaluation

You should be observed carrying out your recitation or workshop at least once each semester by your instructor. In fact, if the end of the semester is approaching and you still have not been observed by your instructor, you should contact your instructor with a reminder that the observation should take place. This should not be your responsibility, but your teaching file and recommendation at the end of graduate school is at play here.

This is important for a number of reasons. One is that the instructor will fill out an official evaluation form to be submitted to the undergraduate office, which gets added to your teaching file. In turn, these comments can be incorporated into the official teaching letter written by a member of the department when you are applying to jobs. Most academic positions, even ones with an emphasis on research, require at least one letter of recommendation written by someone who can comment on your effectiveness as a teacher. A second incentive is for you to obtain quick feedback about your own teaching. Ideally, you should meet soon afterwards with your instructor to discuss your performance, primarily for your own benefit. Try to press for substantial comments from your instructor about specific things you did well, or areas to improve (a generic ``You did fine.'', while encouraging, is not the most helpful comment in this regard). Instructors may not initiate this meeting, so feel free to reach out to them, since most will be happy to have the meeting if you initiate.

On occasion, a member of the department who is not your instructor may observe you. This should not be viewed as a scary experience; again, try to solicit useful feedback from your observer. It is generally because your instructor could not observe your sessions for any of a variety of reasons, and is another way for you to get feedback.

Guide to Teaching

This chapter will provide a breakdown of some of the basic components of teaching and being a teaching assistant.

Pre-Class Information and Mechanics

Day 1 Information

It's important to have information to give the students on Day 1. For an in-person class, it is important to have a document that you can give to the students with some basic information. At a minimum, this should include your contact information (name, email, office) and the basic outline for what these particular sessions will contain. If there are any course policies from the instructor's syllabus that you want to copy here, you could do that as well. All of the larger course policies like grade distribution and schedule should be on the instructor's syllabus, not the TA's.

This should discuss the types of activities that will happen in your recitation or workshop as well as if there will be quizzes (and how often). The particulars of this should be discussed with your instructor before the semester starts. You are welcome to say something like "quizzes will be almost every week" and leave that up to interpretation as the semester goes on if you and the instructor are not sure about the plan yet. Beyond that, it can be helpful to discuss academic integrity, focusing on either quizzes or how the group work that is being done in class fits into this context.

You should plan to go through this document at some point during the first week of recitation or workshop. You could either do it at the start of class or get into the first activity, show students how the class will work, then discuss the syllabus.

Late Work

Before the semester begins, you should settle on a policy of what is to be done about students who hand in work late. (This should be done in consultation with your instructor.) You should almost certainly announce a policy of no late work being accepted. It is certainly reasonable to completely adhere to that policy.

In certain cases, students may attempt to submit work to you by email because they are missing that day's class. Again, it is up to you (after discussion with your instructor) to decide whether or not to accept it, and if so, what the cutoff time for when you have to receive the email is. A desire for leniency is understandable, though this often causes more work for yourself (you have

better things to do with your time than opening and printing a dozen Maple assignments); accordingly, a written policy of “no emailed assignments will be accepted” is quite prudent.

Classroom Analysis

You are encouraged to visit your classroom in advance of your first recitation meeting to scope out any potential problems. Are you in a classroom with a whiteboard (necessitating markers to be brought)? Does the podium block the view of any part of the blackboard (causing you to need to avoid writing in a certain part of the board)?

On a weekly basis, it is a good idea to always show up a bit early. Assuming your classroom has a chalkboard, there should be chalk left for you in your classroom. However, this doesn't always happen, so it is a good idea to keep a box of chalk in your backpack. (If you forget to bring some and your classroom is out, showing up early allows you to scavenge for chalk in nearby rooms.)

Always begin class with a clean chalkboard, erasing anything left over from previous classes. It may be appropriate for you to write announcements on the board, to be reviewed at the very beginning of class. These may include due dates for various assignments, reminders about upcoming examinations, and an outline of the topics and activities for that day's class meeting. Especially near the beginning of the semester, and also periodically throughout the term, you also should be reminding students of your office hours (time and location).

If there is some issue that makes your classroom totally unacceptable for your course, please contact the undergraduate office as soon as possible.

In-Class Presentation Skills

The idea of presentation skills covers a large variety of topics, from how you decide to structure what you write on the board to making sure that students understand it, and that your board work presents a well-organized and well-formed solution to the problem.

Boardwork

Planning

It is important to plan out how you are going to discuss the problem before you even start presenting it. You should consider the following when you are preparing for recitation or workshop:

- Is there anything you want to say or describe before you actually start solving the problem?
- Do you want to set up the problem by first describing the general situation or type of problem?
- Or, do you want to wait until you get into the problem to tie it back to the general topics that are being discussed?

There are benefits to both approaches, so planning out which one you want to do and which one you think will work better in advance is very important. They are both valid ways to structure a recitation and problem discussion, you will need to figure out which works better for you, your class, and the topic at hand.

Organization

The big question here is: how are you going to lay out the problem in the classroom? Ideally, you should want to have the entire problem on the board at the end so that students can see the solution from start to finish all at once. You need to think about how you are going to make this happen. This is something that will take practice to figure out on the fly, but if you know the layout of your classroom and what the board structure looks like, you can work this out in advance.

For this reason, it is good to scope out the classroom that you have in advance of the start of the semester. This will help you determine if you have one or two chalkboards at the front of the room, if you have side boards that you can utilize to help spread things out, and if all of the boards are visible from all of the student seats. In the online environment, you should know how your technology works, what kind of space you have to write things, and how you'll get the entire solution onto the screen at once.

Legibility

Your work needs to be legible. Students need to be able to read and understand what you are writing and trying to explain. This includes pictures being large enough to be seen and understood. This can be hard; pictures and graphs need to be very large if you want the axis labels and notations on the graph to be clear from the back of the room. The process of getting your handwriting more legible can take time depending on where you are starting from. It is a continuous process that develops more and more over your teaching career.

Level of Detail

Another fact to consider about problem presentation is how much detail you want to include on a given problem. The amount of detail that is appropriate can vary a lot between different classes, and even different sections of the same class. For some topics, you may need to go into complete detail on everything, because the details are important for student learning. In other topics, a superficial look at the problem is enough. It also may depend on the students you have in your class. For some classes and topics, the details may be the thing that keeps the students interested, or the things that they actually need to see to understand what they did wrong. You should show enough of the problem to give a complete solution and answer any questions the students have, but should be careful about going beyond that.

When or What to Erase

As before, when solving a problem, you want to have the entire solution on the board at once. Organizing this in advance helps to make it happen. Another important question, particularly for longer problems, is when and what do you erase. You don't want to erase things while students

are still writing them down. To help with this, you should always try to erase and write from left to right when possible. This means that the part of the board that you are erasing (and you shouldn't erase the entire board at once) has been up for the longest time, and so it is unlikely that students are still working on that part of the problem when you go to erase it.

Another situation that needs to be handled with care is erasing lines on the board to do algebraic simplification or skip steps. On one hand, this can help save space and get a full solution on the board all at once. However, you also want students who are falling behind to get the entire solution in their notes, including the simplification steps, so you want to have all of them separated in your solution. If you do decide to erase things on the board, you should make very clear to students what you are doing and why.

This also goes for any mistakes you make during your presentation, intentional or not. If you catch a mistake soon enough, you can erase it without issue, but if you write it on the board and pause first, you want to make it very clear and obvious that you are correcting a mistake so that students correct it in their notes. If there is space, leave the incorrect work on the page, make a note that it is wrong, and then write in the correct version.

Interacting with Students

During Class

Level of Student

The level of the students in your class is something to definitely keep in mind while designing your presentation. The way you talk about topics to a Calculus 1 class is different to how you would talk about the same topic to a Real Analysis class. You should also try to get a feel for how your students feel about the topics at hand before and during your presentation. If your students are confident in the topic, you can go quicker through the ideas and get right to example problems, but if this is a topic that the class is struggling with, you may need to go more slowly through those topics to make sure everyone is on the same page. This can take some time to get used to and to figure out how to adapt in the moment, but it is something to consider. One way to make this easier is to prepare a variety of examples at different levels so that no matter where the students are, you are ready to help them.

Comments and Questions

Recitations are meant to be an interactive experience. You don't just want to stand up at the front of the room with your back to the students (literally or metaphorically) and just go through all of your example problems start to end. You want to leave opportunities to students to ask questions through the process and contribute steps to the solution. An easy way to do this is ask students for the first step of the problem, or what type of problem it is if you are reviewing multiple sections. You can also set up the problem and ask them how to continue with it. The

goal is to keep the students engaged throughout the problem solving process so that they can use this knowledge to solve problems on homework and exams.

International Students

In recent years, Rutgers has seen a dramatic increase in the number of international students, which certainly has an effect on the courses you are likely to be TAing. This can be a challenge, particularly in the areas of cultural norms and language barriers. One tip is that some international students (especially those from east Asia) prefer to go by an Anglicized nickname, so try to find that out. Some students may also give you an Anglicized name when they would actually prefer their actual name. You should ask students what they prefer while emphasizing that you would be happy to call them by either name. It is much better for you to work to pronounce their preferred name correctly instead of just defaulting to the Anglicized name if it's hard to pronounce. An easy way to do this is by including as a question on an early quiz something along the lines of "What name or nickname would you prefer me to call you?".

Managing Time In Class

In my opinion, this is one of the hardest parts of teaching. You need to spend enough time going through all of the examples, making sure that the students understand what you are covering, but you also need to get through all of the topics for that day. Based on the lecture-recitation structure, each recitation period will cover the material from two lectures, which is a lot of material, especially if you are running workshops, where you have about 15 minutes to get through all of these topics. It takes a lot of practice to do this well. Try to limit the problems that you plan to go through in a recitation. Pick a few examples that you are going to work through, and try to stick to only doing that many examples on the topic. You want to pick representative examples that show the main concepts from the day or week.

A lot of this timing depends a lot on your class and your particular students. With three recitations in a row, you'll have three different groups of students, and the timing will be different for all three of them. It really just takes practice and work to try to get this right. You generally get better at this over the course of a semester and over your career as an instructor. This is something that everyone is improving at, including me.

Flexibility and Reactivity

Teaching is not like a research talk. In a research talk, you are mostly presenting the material for yourself or other experts in the field, and people only kind of need to understand what you're talking about. For teaching, the goal is almost the opposite. You are trying to train students to know and understand the material for themselves so that they can use it to solve problems. This

means you want to keep them engaged throughout the process and get them to understand what's going on.

Before class, you should think about how you can react if a student answers a question incorrectly, or if they suggest a method for solving a problem that is not the one that you had planned for. This can happen, and you want to be able to react to this. If a student suggests a new method, you should follow through on that. Use their suggestions and solve the problem from there. This will keep the students engaged and have them believe that they can do it. You should also plan for some of the common misconceptions that you can be ready to address during class. Even if a student doesn't make this mistake, you can bring it up as a potential error to warn them against making it in the future.

Another component of this is asking questions of students to pry for more understanding. If a student has a misconception or seems uncertain about something, you can ask a follow-up question to see what the student actually understands and where the misconception actually is. Questions like "How did you know to do that?" or "Where does that lead you?" or coming up with a related problem that is similar can be very useful to do on the fly to get students to this level of understanding. This idea works well for both office hours and in recitations or workshops.

Managing Group Work

Choosing Groups

In workshops or recitations that involve group work, students can either pick their own groups or you can assign them. For a workshop or recitation that is meeting online, you will need to assign the groups into breakout rooms on Zoom. For an in-person class, it is easier for students to pick their own groups (because they can see each other) but you still may want to assign groups. Assigning groups removes the awkward phase of students trying to sort themselves into groups, and allows them to get to work right away.

In terms of assigning groups, there are a few philosophies to keep in mind. You can either pick groups to put people of the same achievement level together so that they can motivate each other, or to put people of differing levels in the same group so that the more advanced student can get practice explaining topics to the students who are struggling, and the struggling students can get more help figuring out the material. For the first few weeks, you don't really have any information to do either of these, so random groups is likely the best way to go. After the first exam, you can decide if and how you want to restructure from there.

If you are worried about group dynamics and the desire of students to interact, it will likely be easier to put groups of the same skill level together. Since they are on the same level, it will be easier for them to communicate and for you to know how you need to help each group. This is particularly useful in the online environment when it is really easy for students to disengage. In

addition, in the online environment, you may also want to make sure you distribute students who have a tablet around to different groups because that makes it easier to share work.

Group Dynamics

There are a few things to watch out for in terms of group dynamics. Some students may want to take over the discussion and not let anyone else talk and participate. You will want to attempt to balance this out when you visit the group. This is more of an issue in-person, as online, any participation is good. You should try to encourage or get other people's opinions while validating that the student has a lot of good ideas. One way to do this is by asking questions like "What do you [other student] think about this idea?" or "That's one way to approach the problem, how do the rest of you feel about it?"

In some cases, if the group dynamics get bad enough, you'll need to rearrange the group. This can be something that you notice in class, or something that a student brings up to you if they want to move groups. You can plan to switch up the groups on a regular basis (like every month or so, or after every exam) or you can leave the groups the same for the entire semester. If a student wants to move groups, but you weren't planning on changing them, you can offer it to the entire class. Ask them if they want to keep their group or if they want to change. Then, you can move all of the groups that want to be changed around without it being obvious that a specific student asked you for a change.

When you do change groups, you need to give them time to adjust to the new groups. Students in new groups tend to be a bit cold towards each other at the start. Even if they complain or don't like it, give it at least a week for them to settle in before rearranging things.

Helping Groups

During class, you generally want to get a sense for how all of the groups are doing at once. In person, you can do this by cycling around the room and listening in on conversations. You want to give them some time to work before stepping into the rooms to ask questions, because they can't really answer "How are things going?" if they haven't gotten started yet. Online, it's a little trickier to do, because you can't just eavesdrop on conversations. In this case, you'll need to just drop into the rooms and see what is going on.

When you enter a room, you want to try to not be the center of attention. It's difficult, because students will want to focus on you because you are the instructor. However, the goal is to figure out how the group is doing and guide them to the solution and not be the focus. Entering the room asking questions like "What are we working on?" or "How are things going?" can help to soften your entry and start the discussion in the group.

If you notice that only one student is talking, you will also want to encourage the other students to participate as well. If the one student describes a problem, ask how the other people in the group feel about it. If someone is not participating in the group, ask them what they are working on, or ask them if they have any questions about the problem statements or what the goal is.

You should also encourage them to talk to their group mates; if one person explains an idea, ask them to explain it to the other students, particularly if it answers a question they also had.

When working with a group, particularly in workshops, you do not want to give them the answers. Instead, you want to guide them towards finding the solution on their own. You should mostly answer their questions with more questions. Things like:

- What do we know about this problem?
- What techniques do we have from class that can deal with this situation?
- What types of problems can this section solve?
- What did we do with the example earlier in class?

In all cases, you want to be encouraging to your students. These problems are here to help them gain a better understanding of the subject as they work through them. The struggles are part of the process, and insisting on this, while potentially making your students unhappy, can help them to see the point in what they are doing in class.

Timing can be the hardest part of trying to help out groups. You want to spend enough time with the group so they understand your help, but you also have several other groups to get to within the 40-50 minute period. As a general piece of advice, spend no more than 10 minutes at a time with a single group. At this point, you've probably been there too long and need to help other students. You should try to keep it to around 3-5 minutes at a time so that you can make multiple visits to each group in a class. The goal is to move on to a different group once the current one has a direction and a path forward. If a group feels upset about you leaving before you've given them the answer (which you won't do) you can tell them that the point of the group work is to learn how to discuss and communicate math with other people. Which is the main reason for these group workshops in the first place.

Validation

Throughout workshops, students may want validation that their answers are correct. However, in workshops, the goal is to not give them the answer and help them guide their thought processes to get there on their own. There are a couple of ways you can address this issue and solve it in a reasonable manner. You can say that the answer "makes sense" and then ask the student to explain their reasoning. Beyond that, you can ask a different member of the group to explain the reasoning, because they should have discussed it with their partners as well. This works best if the answer is actually right. If they are convinced that their wrong answer is correct, ask them to explain their reasoning again and come up with a counterexample for the incorrect part of their logic. This is something that you will need to come up with on the fly, but it takes practice to get there.

Grading

Grading Expectations

TAs are expected to carry out half of the grading for each examination given in the course, as well as all of the quizzes that happen during the workshop/recitation period. To ensure fairness and consistency on exams, this is typically done with the TA grading half of the problems on every examination, with the instructor grading the other half of the problems. (It is less desirable to have the TA grade the entirety of half of the examinations, with the instructor grading the other half. It is very difficult for two people grading separately to stick to the same grading system.) If you are being asked to do more than half of the grading, please contact your instructor and then the department chair or undergraduate vice-chair if it can not be resolved.

You and your instructor should be on the same page for the issues of notation and simplification.

Is leaving an answer of e^0 or $\sin \pi/6$ unsimplified worth full credit? How about writing $\lim_{n \rightarrow \infty} 1/n = 1/\infty = 0$? What if a student uses an equals sign to mean “implies”, or leaves dx out of their integral? If you ask different members of the department, you will probably receive different answers to these questions.

Most people try to grade in a problem-by-problem fashion (that is, grade problem #1 on everyone’s papers, then move on to problem #2, etc.). This allows for a greater degree of consistency. If possible, you should try to keep yourself in the dark as to the identities of students as you grade. For example, you can always keep the front cover (with the student’s name) flipped over while grading. However, this is not always feasible.

Philosophy of Grading

The goal of grading should be to give feedback to students on how they are doing in the course and give them points for what they do understand. It is also important to keep things consistent between different students in the class. This is generally more important than being correct with the grades (debating between a 6/10 or 7/10), so you should favor consistency over scrutinizing the individual numbers on grades. (In terms of correctness, it helps to realize how little one point on a quiz or exam actually affects a student’s grade, so as long as you are consistent, everything will work out in the end.)

Generally, you should try to award positive points for what students know, not deducting for what they do not know. First, it is psychologically better for students to be awarded points (“+7/10”) than to have deductions. Second, this makes it more difficult for students to argue that they should have received a better grade. (You do not really want to hear things like “You took off three points off for that!?”.) Third, it allows the problem to be graded in a more holistic manner.

A bit of written feedback (showing mistakes they made, or perhaps pointing them towards the next step they should have done) on quizzes is beneficial. However, if you are posting keys on

Canvas, you certainly should not feel compelled to write out anything resembling a complete solution.

Ultimately, your main goal for grading should be consistency. Tradition in the Rutgers mathematics department dictates that there are usually not firm cutoffs for grades (as in, a 90+ or an 85+ is always an A), but rather cutoffs are determined at the end. That is, it should not make a large difference when your instructor assigns final grades whether the quiz grades you give out have an 85 average or a 55 average. (Of course, there may be other motivational reasons to give hard or easy quizzes, or grade harshly or generously. If students are becoming complacent before an examination, it is better for them to find out their weaknesses on a quiz, while if morale is low, an easier quiz may positively impact this.)

Try to keep yourself in a good state of mind while grading, and take frequent breaks. You do not want to get personally frustrated by the grading, and then have that frustration be taken out on students. If two dozen people make the same “dumb mistake” that they really should not have made, all of them deserve the same grade on that problem --- but if you are frustrated, your grades awarded may reflect that. This sounds obvious in theory, but is something that you genuinely have to watch for.

Methods of Grading

One of the more structured ways to handle grading that can help with consistency is to use a rubric that you create for the problem. First, work out the problem yourself, clearly separating steps. Then, go back and distribute points that add up to the total number of points assigned to the problem. Formulas remembered, techniques used, computations carried out correctly, and answers correctly interpreted may all be worth points (of course, not all of these will be present in every single problem).

In general, you should attempt to give a grade that roughly corresponds to a student's conceptual understanding. If a student makes a minor error early on in the problem, yet carries out the rest of the calculation correctly, it is usually best to award most of the points. The exception is if the error ends up significantly simplifying or changing the nature of the question. In that case, a more severe deduction is justified. Errors that demonstrate fundamental conceptual shortcomings (for example, a mistake based on a failure to distinguish between a scalar and a vector) probably deserve to be judged relatively harshly.

It can be a good idea to look through a handful of actual student answers while constructing your rubric, and, after grading several responses, you may want to go back and tweak your rubric. (For example, giving the same grade to two different answers, even though one of them clearly felt like the “better” answer, might be a cause for adjusting the rubric.)

Grading Technology

There are two main technological tools used for grading. The first is Canvas' default grading tool, Speedgrader. Speedgrader allows students to upload files to Canvas as a PDF or many other file formats, and you can view these in the Canvas window, add comments, make pen markings on the page, and assign a score. It is fairly easy to do, but you can speed up the process using the built-in Rubric feature. If you have a clickable rubric for all of the different point values on the assignment, that can make things go quickly and be more consistent. On the other hand, if you have a Rubric with the "Leave Free-form comments" option checked, you can type comments into the box and, if you click "Save Comment," those will be saved for all future students on that same assignment. This can be very useful if you want to reuse comments on later students' work. For more details on SpeedGrader, see [How do I use SpeedGrader? - Instructure Community](#).

The second tool that is more commonly used is Gradescope. Gradescope is a separate software from Canvas, but with the site license we have for Gradescope, it can be embedded into your course site. You can make assignments within Gradescope and have students upload their solutions directly to the platform. From there, you can build a rubric and make comments like normal. Any comments you type are automatically saved and can be used for other students as well. The main benefit to Gradescope is that it automatically (provided the assignment is set up properly) splits the assignment up by problem. That way you can go through all of the problem 1s in a row, then problem 2s, and so on, without extra page flipping. This is very commonly used for exams, but can also be used for workshop or quiz grading. For more information on Gradescope, see [Gradescope - Canvas](#).

Computational Assignments

In several classes, students may encounter computational assignments. These are particularly relevant in Math 251 and Math 244, but other instructors may also decide to include them. Math 244 has Matlab assignments, and Math 251 has numerical assignments that use Desmos or Geogebra, but may use Maple or Matlab as well. Some TAs are concerned about being assigned 251 or 244, in spite of having no experience with Maple or Matlab. In practice you can learn what you need to know quickly.

You may get questions from students about these assignments, which you should respond to as best you can. You should try to avoid having questions about these assignments take up too much time (if any) in recitation. If possible, try to relegate these questions to office hours or emails, because the computational question can spiral out of control if you or the student doesn't know exactly what's going on. It is much easier to handle these questions when you have your computer in front of you to figure it out.

Communication with Instructor

Communication with your instructor is a very important part of running a successful course as a TA. The two of you are a team that are teaching this class together. The instructor is overall in charge of the course, but the two of you are working together to build a successful experience for your students. You should be in touch with your instructor fairly consistently throughout the semester.

The two of you should be in contact before the semester starts. If you do not receive an email a few days before the semester starts (or after the coordinator meeting), you should email your instructor to get things set up. You want to be on the same page at the start of the semester to present a unified front for the students. You also want to make sure that you are in line with course policies like late work, quizzes, and attendance before the semester starts.

You will also want to be in touch with your instructor throughout the semester to make sure that you are covering the right content each week in recitation or workshop and that your quiz lines up well with what has been discussed in class. If you are writing quizzes, you should send these to your instructor each week so that they can verify that it looks good. If they tell you that you don't need to send them anymore, that's fine, but you should at least start off sending them every week. It may fall to you to start these conversations, but it is important that they happen to make sure that the course runs well. If there is confusion or a conflict between you and your instructor, the students will know.

You and the instructor are on the same team with the course. The students may think that you are more friendly than the instructor (which you can be, and that's fine) but at the end of the day, you are part of the instructional team. This means that you need to stick by whatever decisions the instructor makes and should not undermine them in your recitation sections. Make sure you do not say things in class that are in direct opposition to what your instructor has said. Communicating with them can help prevent this from happening.

This also affects how you do things as well. If your instructor requests something from you in terms of how you carry out your duties for the course, you need to acknowledge and adapt to that suggestion. It doesn't mean that you need to blindly follow what they say, but if you are going to do something different from what they suggest, you need to have a valid reason for it and discuss it with the instructor in advance. Valid reasons could be things like "I think this alteration would better for our given students" or "I've seen this play out in recitation previously and it seems to be working well." A valid reason is not "I don't want to," or "That is more work for me" (unless you're already putting in too much time; see earlier). You can't just not do what your instructor tells you to do. They probably have a good reason for making that request.

If you are having issues contacting your instructor, you can reach out to the course coordinator or undergraduate vice chair to get assistance. You should first try to reach out several times and stop by their office hours (if possible) to get the information you need, but if that doesn't work, the department administration can try to help.

Standard Policies and Duties

Time Commitment

The standard contract is that TAs should spend 15 hours per week on average on their teaching duties. This is an average over the course of the semester. You will likely be spending more than 15 hours during exam weeks because the exams will need to be graded with about a 1 week turn around. However, this should be balanced out by the time spent during other weeks for the semester. For example, spending around 12 hours on non-exam weeks means that 20 hours during the 3 exam weeks is within the contract. If you feel like you are working well beyond this amount on average, you should talk to your instructor to see if there's anything that can be done to ease the workload.

Beyond that, if you feel like what is being asked of you is well beyond what should be expected of a TA and is taking you too much time (and you are not able to resolve it with the instructor), you can email the course coordinator or Undergraduate Vice Chair to try to work something out. You should be trying to accomplish all of your teaching duties in a reasonable amount of time, but if it is too much, a discussion with your instructor, and then the UGVC if needed, can help to make things go more smoothly.

Quizzes

In most recitation sections and many workshop sections, your instructor will want you to include a quiz as a component of the 80 minutes spent in class. Administering and grading quizzes is one of your most important duties, as frequent quizzes impose accountability on students, allow them to gauge their understanding, and convince them to attend recitation sections that they might otherwise choose to skip.

It is up to the instructor and the TA to determine who is responsible for writing quizzes, but the general default is that the instructor will write them. As a TA, it can be good preparation for future teaching assignments to practice writing your own quizzes. If you do write your own quizzes, you should be emailing your instructor your quizzes to make sure that they are okay. Apart from catching typos, this helps ensure that the questions are at an appropriate difficulty level, which is probably around the level of exam questions (although there are certainly reasons to make the quizzes slightly easier or slightly harder than exam questions). Choosing problems similar to assigned homework problems is usually a safe bet. It is best to email your instructor a handful of days in advance, to allow time for feedback, revision, and copying.

Make sure that you actually ``take'' the quiz yourself to make sure there are no issues. The idea is to make sure that the problems work properly. If the instructor is giving you the quizzes, you will need to get them early enough in advance to be able to check these things. If this is not happening, email your instructor to ask if you can get the quizzes earlier. It is reasonable to ask for a bit of extra time so that this test run can fit in your schedule. Depending on content and

frequency, you should be allowing students approximately 10 to 20 minutes to take these quizzes. A decent rule of thumb is that one problem should take students somewhere between five to ten minutes, depending upon length and complexity.

Some instructors and TAs use different quizzes for their three different recitations, to help cut down on students in later sessions having an advantage from talking to their friends in an earlier session. Different quizzes may have essentially the same problems, but with altered constants or functions, or may have completely different types of problems. Other instructors and TAs choose to use the same quiz, as this is simpler, and does not lead to issues of ensuring similar difficulties between sections. This is a matter to discuss with your instructor.

Relatedly, another policy that you will want to decide for yourself is how strict you should be with collecting quizzes when time is up (usually, the end of the class period). While a bit of leniency is fine, be aware that some students will need to leave promptly to arrive at their next class on time, so allowing a lot of extra time may be unfair to these students. Also, some students will simply work for as long as you allow them to in hopes of a sudden breakthrough, even if they are no longer making progress. Cutting them off can actually be a relief. You should let them go for no more than 5 minutes past the end of the class period.

You should strive to mimic exam conditions in these quizzes. For example, if the instructor will provide formulas for examinations in Math 251, it would be strongly recommended to include the same set of formulas as appropriate. Actively proctoring quizzes to prevent cheating by walking around the room also demonstrates to your students that you take quizzes seriously (and hopefully encourages them to as well).

Whether or not you post keys for the quizzes should be discussed with the instructor. It can be a tricky balance between providing more resources and having students who will just look at and copy that solution, assuming that it is enough. Make sure you have discussed this in advance before students ask about solutions to quizzes.

Perhaps more importantly, before the semester begins, you should settle on a policy of what should be done when students miss quizzes. (This should be done in consultation with your instructor.) Some TAs give makeup quizzes, typically given during office hours in the following week. This does become a bit of a hassle - what if the student cannot make your office hours? Do you feel the need to write a different form of the quiz for the student? Other TAs will simply excuse students with a valid, documented excuse, which does make things a bit simpler. Regardless of which option you select, your policy should be clearly announced at the beginning of the semester. A no-excuse, no-makeup policy is not to be recommended, as some students may have absolutely legitimate reasons to miss class for which they should not be penalized (for example, athletes missing class for away games). In any case, whatever policy you want to use should be discussed with your instructor.

Office Hours

You are required to hold at least 80 minutes of office hours per week. Most TAs fulfill this requirement by holding a single 80 minute block, or by holding two blocks of approximately 60 minutes each. It can be a good idea to coordinate with your officemates to ensure that you are not all holding office hours at the same exact time and day. Additionally, you will want to work with your instructor to make sure you are not holding simultaneous office hours. (Even more undesirable: holding office hours at the time of lectures!) Office hours traditionally do not happen during the first week of classes. Accordingly, some TAs will poll their classes (either in person at the first recitation or online) with some sample office hour slots. Of course, there is nothing wrong with scheduling your office hours before the semester begins. Once you schedule your office hours, you should announce it to your students. This should be done both on Canvas and in person. Times should also be posted prominently on Canvas.

If you teach on a campus other than Busch, you may want to consider holding your office hours on that campus. (Students on Cook/Douglass may not want to come all the way to your office in Hill to attend office hours.) The math department can help you find office space on each campus. Contact the undergraduate office for more information if you desire to use this extra space. In addition, it is fairly common for some, if not all, office hours to be available online via Zoom. This helps a lot with the commute issues, as students are much more likely to pop in for a quick question if they can just do it online instead of traveling all the way to Busch. In this case, you should post a Zoom link to the Canvas sites for students to use.

You should be reminding students that your office hours exist on a pretty frequent basis. In particular, students newer to college may not be familiar with the concept of office hours, or may see needing to attend office hours as shameful in some way. For other students struggling in class, their first instinct is to start meeting with a tutor, without realizing that they can get what is essentially free tutoring from your office hours. It is incumbent on you to repeatedly emphasize the benefits of attending office hours, and the fact that attending office hours does not make them a “bad” student (in fact, just the opposite is true!).

Generally, office hours involve coaching students through problems in the course. This could be you working through an example for a student, guiding a student through working it out on their own, or getting input from multiple students to complete a problem. This should all be very student focused, with them driving most of the discussion and you filling in details when appropriate. You want to figure out what they know to best be able to help them.

If multiple students show up, things can get a bit tricky. If they are interested in different topics (for example, one wants to talk about Maple, one wants to go over the material from yesterday's class, and one wants to discuss something from two chapters ago that they never really got), you will want to rotate between them. Ideally, you can work with one for a few minutes, and then give them something to work on while you switch over to work with someone else.

You are not obliged to stay past the end of your official office hours. Some students will stay for as long as you allow them to (perhaps out of sheer ignorance that the session is supposed to be over). If you are uncomfortable with kicking students out at the end of your time, you can always schedule your office hours right before some other commitment you have (like a class or a seminar) so that you have a ready-made excuse to end the session. Or, make up an extra commitment that you need to leave for.

Students should not have an expectation of being able to show up at your office at any time, but you will occasionally encounter students appearing at random times. (This may not necessarily be intentional --- these students may simply have misremembered the times for your office hours.) It is okay for you to tactfully point out that these are not your office hours (and not help them at that point).

Be warned that office hours the day before an exam will be very, very popular.

Review Sessions

Holding review sessions before examinations (midterms and finals) is not mandatory but will be greatly appreciated by students. Good times to schedule these include weekends, evenings, and “reading days” (a one- or two-day break after the final day of classes and before the first day of final examinations), as this is when you are likely to maximize the number of students available. To book a room for a review session, contact the undergraduate office, preferably at least a week and a half in advance. It can also be held on Zoom, but in-person reviews are generally better.

As for the content of a review session, this probably looks somewhat like a typical recitation (although perhaps longer in duration --- perhaps two or three hours). There is a good chance that your instructor has posted some kind of review sheet; going over these problems is a solid choice.

Just as in a recitation, you should make a decision as to whether you will be choosing the problems to go over, or fielding requests from the audience. While the former may make for a tighter presentation, the latter is probably better for a review session. One potential danger with holding “review sessions” is that some students may have the mindset that if they just show up to the review session, you will teach them everything they need to know, and they will be fine for the exam (without putting in much work on their own part). You want to try to mitigate this as much as possible. Emphasize that these will only be some types of problems covered on the exam. If you have student-led sessions, you can emphasize that based on student interest, we may not get through everything, or that you might cut some examples short to make room for other conceptual topics and leave them to work out the details.

A different kind of review session is one that is more modeled off of the workshop setting. You can bring sheets that contain lots of questions (probably more than they can get through in the

time allotted for the session), and simply encourage students to work on them in groups as you facilitate (with a preference towards problems that they do not know how to do).

As an alternative, you may want to hold extra office hours right before an examination, because the office hours force students to prepare ahead of time and invest in their own learning as they figure out what exactly they need to learn. However, this runs the risk of overflow. (Predicting the number of students that will show up is very tricky!)

Emails

Emailing students on a regular basis is a good idea. Typically, this will be reminding them of various things coming up --- assignments due, quizzes on specific sections, etc. Make sure you talk to the instructor before this though, you don't want to send out two sets of conflicting information. This goes double for the situations when your first recitation meets before the first actual lecture, which occasionally happens. (Note: recitations should not be canceled when this happens, though it can be a little unclear what is the best use of the instructional time. Review of past courses and a diagnostic quiz are reasonable choices, although there are certainly other possibilities. If this happens, discuss it with your instructor.)

You can contact students through the ``Announcements'' tool on Canvas. This is highly recommended whenever something is being sent to all students. These announcements stay on the Canvas site permanently, so students can't argue that they never saw it. In certain cases, you may want to email students individually. One place you can find student email addresses is through the official roster at sims.rutgers.edu/rosters. Canvas is another alternative; you should be able to do this with the Canvas Inbox (where you can also set up lists for small groups of students).

Of course, students will frequently be emailing you with questions of their own. Part of your job responsibilities are to promptly and appropriately answer these emails. Department policy is that you must respond in two business days, but you really should aim for one business day/24 hours during the week. It is reasonable to not be checking your email as frequently over the weekend.

The main type of question here is probably one related to the material of the class --- ``I don't know how to do this.". Students should be encouraged to ask questions, and you should do your best to respond in a way similarly to how you would answer the question in office hours. Of course, the text-based nature of email does have some limitations, and you should not feel obliged to type out every step of evaluating an integral in spherical coordinates. Include the first step or two, sketch out the overall flow of the problem (perhaps referencing a specific example in the textbook), and invite the student to your office hours, where you will likely be able to give a more enlightening explanation.

Other questions are more logistical in flavor. Try to avoid getting frustrated with students asking you questions whose answers are in the syllabus. Finally, you will receive emails asking you to

bend course policies in their favor in some way (students may not realize these policies exist, of course; this often goes hand-in-hand with not reading the syllabus). If you have clearly stated policies, then it is fine to firmly adhere to them, though you should strive for tactfulness when communicating this to students. That being said, it can be appropriate to use a bit of grace at your discretion (talking to your instructor can help you out here).

Quite often, students will contact you with a non-Rutgers email address (think jane.doe1998@gmail.com versus jcd147@scarletmail.rutgers.edu). No matter what the question is, your best course of action is to tell them to use a Rutgers email. You can say something like “I have seen your question and will respond to it once you send it from a Rutgers-affiliated email address” and then wait for the other response. The main issue is that it would be a potential violation of privacy rules to give out sensitive grade information to a non-Rutgers email address. It can even be an issue to confirm whether or not a student is in your course to a non-Rutgers email address. In this case, it is best to politely ask the student to recontact you from an official Rutgers email account.

Solutions

Whether or not solutions to course components should be posted on the Canvas site is up to the instructor and course coordinators, if applicable. For example, the solutions to workshop problems should not be posted on the Canvas site, because those problems are reused from semester to semester, and the solutions being out there could cause problems for future semesters. However, for individual quizzes or homework problems, that decision is mostly up to the instructor. Posting solutions can make it easier to give feedback (because you can just point them to the solution) and can give students more resources to use to study, but the solutions need to be written up carefully and completely. You do not want students studying off of a partial solution and assume that the amount of work there is enough to get them full credit on an exam.

Canvas Sites

The course instructor should be in charge of the Canvas site for the course. You may need to ask the instructor to add you to the site, ideally as a teacher or Teaching Assistant so that you can add and control content on the site. You should confer with your instructor before posting things to the site, but you should use this to send announcements, emails, and post materials to the students. It is much easier to do this than to send individual emails or try to manage everything through the email client.

Things can be organized on the Canvas site in a few ways. One of the easier ways to do this is with the Modules tab. This allows for files, pages, and assignments to all be grouped into categories that students can easily view and minimize when they are no longer needed. This works best when the entire course is set up using Modules. If your instructor is using them, then you can decide the best way to post things on the site, or discuss it with your instructor.

If your course is not using Modules, then you can use either Pages or Files to organize the content. Files is basically what it sounds like; it is just a directory where you can upload files and sort them into folders for students to find and use. If you make a folder for “Recitation Notes” or something and put all of your notes in there, labeled by date, students can make use of those. Pages allow you to put together a webpage that is hosted on the Canvas site, where you can write text and link to files/other webpages. You can upload anything you want to Files and then link to it on a Page if you want to organize it and make it look a bit more organized.

The other important use of Canvas sites is to send messages to students. There are two ways to do this: “Announcements” which posts a message that the entire class can view and will remain on the site indefinitely, and “Inbox” which allows you to email individual students. Some students will also send you messages through the Inbox function, so you should check it frequently. You can set up your Canvas settings so that whenever you get sent a Canvas message it sends you an email, which is highly recommended. The Inbox has many other capabilities, including emailing students who have a certain grade on assignments or haven’t turned something in and emailing a group of students the same message, but all individually, so they can’t see who else received this. These are all worth looking into for different situations in class.

ODS Accommodations and Absences

Generally, if a student has access to an accommodation from the Office of Disability Services (ODS), you (or the instructor, or both) will receive an email directly from ODS with the letter attached to it. The letter will basically say that “in order to participate fully and equally in this class, the student is granted the following accommodations for this course” and then go on to list them. The most common accommodations are granting extra time (50% or 100%, typically) and a distraction-free testing environment. These are to be taken very seriously, although the bulk of the responsibility of ensuring that correct policies are followed in your course should fall to the instructor.

The main way you will interact with this is in terms of quizzes, since extra time would apply to those too. It is very difficult to work this out in a satisfactory way with quizzes at the end of class, but there are a few options

- The student takes the quiz with the rest of the class, potentially with extra time at the end
- The student leaves class early to take the quiz with ODS (or online)
- The student takes the quiz before class with ODS (or online)

Discuss all of these options with your instructor before the semester starts to figure out the best way to arrange it for this class.

The health centers on campus typically do not give out any kind of excuse for medical absences. If a student is genuinely ill and visits a health center, they may be unable to provide you with a documented excuse. In this situation, erring on the side of leniency is probably the best idea.

Other Policies and Guidance

Academic Integrity and Proctoring

Quizzes and Other Work

You should try to preserve academic integrity throughout all of the course work within your recitation. The main thing to focus on here is that all work that students submit should be their own. This includes quizzes, workshops, and any other activities that are done during class. For quizzes, the easiest way to make this happen is to cycle the room (for an in-person class) during the quiz to make sure that no one has a phone out or is communicating with the other students (see Proctoring below).

Maintaining academic integrity on other work can be more tricky, especially if students are working in groups on workshop problems. The main thing you want to insist on is that students work together in groups during class, but then don't write up their solutions until later that day once they leave class. They can make notes on the problems together, but should then try to synthesize them into a final product individually.

This only really becomes an issue that you are made aware of when students turn in identical workshops. If you are concerned about work that is being turned in, you should discuss it with your instructor. Your instructor may decide to file a report of a potential academic integrity violation, or may want to just leave it alone. Unless you have significant evidence that there was cheating on the assignment (like a solution verbatim from Chegg), it may not be worth filing the report.

Proctoring

You are expected to proctor all examinations (midterms and the final) alongside the instructor. This includes distributing examinations at the start (there may be multiple forms of the examination that need to be passed out in a certain order), helping the instructor collect the examinations at the end of the period, and generally watching students during the examination itself.

It is better to prevent cheating from happening than to deal with the aftermath of reporting an academic integrity incident. To this end, it is important for you to spend most of your time while proctoring moving around the room. Make sure you can see everything going on in the classroom while the exam is taking place.

It is a good idea to discuss with your instructor just how much clarification you are allowed to provide to students asking questions during the examination (the default here is "not much").

Students may also request to leave the classroom to use the restroom. Consult your instructor with what to do here (some will have policies such as only allowing one student out at a time).

If you have a conflict with the examination that prevents you from being able to proctor, (for example, you yourself are taking a graduate course that meets at the time of the examination), you should switch proctoring duties with another TA. This is normally done by contacting the undergraduate office and having them find someone to substitute for you. If you've already talked to someone about it, you can provide their name, and they'll work out the details.

Reporting Academic Integrity Violations

The process of reporting potential academic integrity violations is a little bit tedious, but is something that we are required to do if it is of concern in our classes. Most of this will be handled by your instructor, but it's good to know the process.

1. When it is suspected that a violation of academic integrity has occurred, the instructor will file a report at <http://nbacademicintegrity.rutgers.edu/>. There are details of what constitutes a violation of academic integrity at <http://nbacademicintegrity.rutgers.edu/home/academic-integrity-policy/levels-of-academic-integrity-violations/> or the PDF with the official policy is on the website <http://nbacademicintegrity.rutgers.edu/home/academic-integrity-policy/>.
2. After the report is filed, the academic integrity office will contact the instructor about how to proceed. The instructor can handle the report themselves, or an Academic Integrity Facilitator can handle the discussions with the student. At this point, the instructor will send a form email to the student informing them that there is an investigation into a potential violation of academic integrity, and they either need to set up an appointment with the instructor or the AIF to discuss the situation.
3. An investigation is conducted, where the student is interviewed about the event, and the person in charge of the investigation will make a final conclusion, informing the student of the outcome, as well as the sanctions that will be imposed based on it.
4. The student then has to reply to agree to the sanction, or they can appeal the sanction within 10 business days. At that point, everything is finalized and the instructor is done with the report.

Time Management

Preserving Your Time

As a graduate student/Teaching Assistant, you have a lot of different responsibilities and need to make sure that all of them get done. Teaching (and grading in particular) has the potential to take up a lot of time and can get in the way of your research or your own classes. It can help to schedule time for your teaching work, and pick appropriate times of the day/week to do them. For instance, if you tend to feel sluggish after lunch and don't want to get 'actual' work done, you can use that time to respond to emails or do some grading. It can also help to devote entire

days to either doing teaching work or not doing teaching work (outside of emails) if that helps you focus and compartmentalize things. Another technique that may help with compartmentalization is to schedule things for future days to avoid worrying about them. Scheduling that grading will be done on Friday may make it so you aren't worried about it on Thursday.

Emails can also take a lot of your time, particularly if it is the only way for students to contact you. This can be helped by scheduling specific times each day when you will check and respond to emails, and then not checking email at other times of the day. You will likely want to schedule multiple times a day for this, so that students still get their emails responded to in a timely manner, but it doesn't take up all of your time.

Staying Organized

Handing back quizzes, workshops, and other graded work is something that can take up a surprising amount of time if you are not careful. A simple way to handle this is to arrive early to class and give yourself enough time to hand back papers to the students there early. However, once class time officially begins, stop this process to be resumed at the end of class. If a student comes in late and asks for their quiz, you can politely tell them to wait until the end of class to get it. After examinations, instructors may have you pass back graded examinations, which makes sense (handing back around 90 examinations at the beginning or end of a lecture is a rather difficult task).

Passing back papers is something that you should do yourself. It is not something that you should accomplish by leaving a stack on your desk and having students search through, or by passing the stack around the room. This is to preserve confidential grade information, but also has the nice side benefit of helping you practice names. It is recommended that, in case a student is absent when graded work (such as examinations) is being returned, that you not give it to a "friend" of the student instead to protect privacy.

You will be expected to record the grades for quizzes and possibly other assignments. Storing grades in the Canvas gradebook is probably the default option, although some instructors may prefer using a separate spreadsheet.

Alphabetizing work before you hand it back is a time-saver (really, you should alphabetize before you enter the grades into the computer). Also, it is a good idea to have section numbers at the top of your quizzes (I would put all three of my section numbers and have students circle the appropriate one). Again, this will make organizing your papers go more quickly.

Online and Remote Teaching

Platform

The main platform currently used for remote teaching is Zoom. There is a Zoom integration into Canvas that gives students access to the Zoom links directly through the Canvas site, but it doesn't do much else. You can work on the Zoom Whiteboard, and upload PDFs to annotate, but you can not save these annotations afterwards. Poll questions need to be written up beforehand, but if you have students register for the session, then you can download a list of which students answered each question. Zoom allows for up to 50 breakout rooms, which is nice for larger classes, and transitioning between breakout rooms is slightly less aggressive than other options. However, you can only be in one breakout room at a time.

Digital Whiteboard

When teaching an online class, you want some way to write in order to communicate with your students. There are several tools and programs that can be used to make this happen. In terms of programs, one of the easiest to use that is also free is Microsoft OneNote. This program gives you an infinite scroll blank page that you can write on with a device that supports it. You can also type on the page/document, so that you can type out problem statements and an outline for the day and fill in the document with handwritten information and solutions during class. You can run this program on either a tablet or normal desktop computer, and it is fairly easy to export the filled in notes to a PDF after class.

In terms of tools and devices, there are also several options. The easiest option is a writing tablet like the Huion H610 Pro V2. This plugs into a USB port and allows you to write on the tablet to replace the mouse on your computer. This can be used with any of the programs discussed previously to allow you to write on them. This will allow you to write with a pen instead of drawing with your mouse and make it clearer for the students.

Another option is a tablet or tablet computer. An iPad with an Apple Pencil will allow you to do the same thing, writing directly onto the screen and displaying it to a student. Zoom also has a native connectivity with iPads that are on the same network as a computer connected to a meeting. You can "Share Screen" from a connected iPad just like you would any other window on your computer. In addition, an iPad also has the additional app options of GoodNotes and Notability, both of which are fantastic iOS exclusive handwriting apps.

Tablet computers can be used in a similar manner, except you will likely need to join the meeting twice, once on your main computer and once on the tablet. The main computer can be how you observe students and answer questions, and the tablet can just be what you share-screen from in order to show your notes and write on them. A Microsoft Surface works great for this, as well as any other tablet or 2-in-1 computer.

Group Work

For running group work in an online class, you will want to utilize Breakout Rooms. These will put students into small groups in separate rooms so that they can discuss and work together on problems. Particularly for online group work, you want to have very concrete directions for what the students are supposed to do while they are in groups. It is very easy for students to tune out and not really pay attention if they don't have specific goals and directions.

In order to check how the group work is going, you will need to join the breakout rooms individually. This can be hard to do when you can't eavesdrop on the conversations, so you'll just need to pick one and join it. Generally, you'll want to give the students some time to get started on the problems before you join the room, otherwise they won't have anything to talk about. When you do join the room, try to engage at least most of the students to say something about what they are working on. A lot of the same techniques from normal workshop sessions work here as well. You don't want to be the center of attention when you come into the room, although it's hard to do in a Zoom meeting when you pop up on screen. You will want to soften your entry as much as possible, or tell them to pretend you aren't there. Online, you'll have minimal participation from most students, so you may need to actually encourage them to talk to get anything out of the group work.

Another option for monitoring group work in a class that involves more typing than math equations is to use Google Docs, where each group has a Google Doc that they can work on and type into during class. Then you can have all of the Google Docs open at the same time and monitor all of them, jumping into the breakout room where you are needed most.