

TA and Lab TA Guidebook

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ILLINOIS WESLEYAN
UNIVERSITY

Preface: Congratulations on becoming a teaching assistant or lab monitor. You are now part of the Illinois Wesleyan math department. It is important to know the goals of the department. One goal is to create an open environment where students will strive for a deeper understanding of mathematics. We want to create a self-reliant community that will foster an interest in mathematics for many years to come.

The following are the student learning goals for the mathematics curriculum and major which can be found on the [IWU Math homepage](#).

Goal 1: Analytical Skills

- Learning the mathematical language and how to read mathematics.
- Understanding the importance of definitions and their use in proofs.
- Learning how to formulate mathematical statements (e.g., definition, theorem, axiom, conjecture) precisely.
- Learning how to construct and test hypotheses and conjectures.
- Developing the ability to create and evaluate mathematical proofs and arguments.

Goal 2: Rigorous, Logical Thinking Skills

- Developing reasoning skills.
- Developing habits of clear and precise logical thinking.
- Developing habits of clear and precise writing.
- Strengthening habits of rigorous logical thought.

Goal 3: Problem-Solving Skills

- Developing a knowledge base.
- Developing problem identification and problem solving skills.
- Learning how to apply and relate mathematics to practical problems.

Goal 4: Communication Skills

- Learning how to read and write mathematical proofs.
- Learning how to communicate mathematics in verbal and written form.

Goal 5: Computer Skills

- Learning how to use computers to solve complex problems.
- Learning how to use computers to check and apply a theory.

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Chapter 1

Before Classes Begin

Once you have been assigned to a class as a TA, one of the first things you should do is to introduce yourself to the professor whose class you will be assisting. This meeting is important for understanding what the professor expects from you, as well as for obtaining the necessary materials for the course. If you should ever feel confused about what you should be doing, your best resource will be your professor. Typically the job of a TA is to help students better understand the material from class, and to help grade assignments. However, the duties of your job will vary as a function of both the professor and the course. Communication is crucial. For more advice on communicating with students, see Chapter 2. For more help on grading assignments, see Chapter 3.

Some professors don't allow the students in their courses to seek help from TAs other than those assigned to that course. This occurs for various pedagogical reasons. Typically, in these courses the process of independently struggling with a problem and eventually discovering how to solve it is more important than the solution itself. Therefore, answering questions for students taking these courses is a very delicate matter. It is the responsibility of every TA to be informed about which courses fall into this category. If you find yourself in a situation in which you're not sure whether to answer a question for a student or not, then you should first consult the professor of that course. Talking with the TA for that course can be helpful too.

It is also important to understand how others perceive you as a TA. Your role with other students will change. You may not see it, but your students will. You are now meant to take on a professional role, and all the responsibilities that are entailed. Some of these responsibilities include:

- Acting in a professional manner whenever you work. This means speaking and acting in a professional manner.
- Keeping the faculty up to date about what you have been doing with the students. Before the beginning of the course you should ask if it's possible for you to get a copy of the book your students will have, so that you can keep up with the material.
- Acting as a member and representative of the IWU math department and following the goals of the department.
- Teaching students how to think about problems, rather than simply giving them the answers. This means taking the time to understand the rationale used by students to solve problems. For more help with this, see section [2.1.2](#).
- Remember that you were selected for this job for two main reasons: you communicate mathematics well, and you have excelled in the course for which you are a TA.

Chapter 2

Communicating with Students and/or Faculty

2.1 Communicating with Students

As a TA it is important to communicate with the students in your class. At the beginning of the year your students won't know who you are. One way to help with this would be to introduce yourself to the class on the first day if you are available. Also, writing your name on the board near you during tutoring hours can help students to find who they are looking for. Make sure to let students know when and where you will be available for them. Creating a schedule and sending it to the class is a good way to accomplish this. **If you are unable to make it to your scheduled hours be sure to let your students and professor know.** If you are holding a review session or any additional tutoring hours, be sure to communicate this with your class and professor. Now, while you should try to communicate with your students about what's going on in the class, you should always communicate with a professional manner. Below is an example of an email that you could send to your class at the beginning of the semester. The same level of formality as demonstrated below should be met by any other correspondence that you send to your class. Also, be sure to copy the professor on any emails that you send to the class. The professor will appreciate being informed on what you are doing to help the students.

Example Email

Dear students of Calculus I,

My name is Suzy Queue and I am happy to be your TA for MATH 176 taught by Prof. Euler this semester. I am here to help you understand the material. To facilitate this, I will have walk-in tutoring hours during the following times in CNS E204. Please come by at any time to ask questions.

Monday: 7–10pm

Tuesday: 4–6:30pm

Thursday: 4–5pm

Sunday: 6–8pm

Just a bit of background about myself. I am a junior mathematics and physics double major. I took this course two years ago, so I can help you through the patches that were rough for me. I look forward to a productive semester with you.

Sincerely,

Suzy Queue

Speaking in a professional manner also means protecting a student's privacy. Therefore, you should never discuss grades in public. It's one thing to say "congratulations" or "you're a very strong student," but quite another to say "I thought you would have done better than Tommy." **As a general rule, never disclose information about a student's grade to anyone other than those directly involved in teaching the course.** You should also be mindful about the comments you make. To the students in your class you are not seen as a student, but as a teacher. Your comments and opinions carry a significant amount of weight, so strive to keep your comments positive in nature.

Furthermore, be respectful of the autonomy of other TAs and faculty. This

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includes any evaluations you might offer during conversations with others. There are at least as many teaching styles as there are natural numbers. Be respectful of the pedagogical practices of others. If you have a disagreement with a colleague, then keep things professional. For example, if you feel that something in another course was too challenging for the students, then let the colleague know directly rather than complaining about it to your students and/or other TAs.

2.1.1 Resolving Conflicts

In the event of a minor conflict between two TAs, the parties involved should first try to reach an amicable resolution. If this is not possible, then the conflict should be reported to the immediate supervisor. The hierarchy of command is listed below. All conflicts between TAs and students should be reported directly to the professor of the course involved.

1. Chair of the Math Department
2. Professor of the course
3. TA Supervisor
4. TA of the course

Any conflict between a TA and the professor of the corresponding course should be reported directly to the Chair of the Math Department. This procedure should be followed regardless of whether the issue is raised by the TA or the professor.

2.1.2 Helping Students with Homework Problems

When students come in to ask you for help it is important that you know how to best respond to them. There are many different methods you can use to help students, and you need to discover the right mix that works for you. When a student comes in with a problem it is important that you

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understand what they know at that time, as well as their level of understanding of the concepts. Because of this it is important to stay up to date on your class and it's always important to be prepared to answer any questions that the students may have. If you don't know the answer to a question, then refer them to someone who does.

When a student approaches you with a problem it is important to ask them how they approached it. *Asking students to clarify and explain their approach will have a more significant impact on their understanding than simply telling them the answer.* Students typically have at least a vague idea about what they are trying to do, but may be having some issues with the finer details. In order to help them with the problem there are a few approaches you can use.

- Make sure they fully understand what the question is that they are trying to answer. They should also have a clear idea of what an answer to that question would consist of.
- Sometimes talking through their proposed solution step-by-step is enough to lead the student to their mistake. Have a student lead you through their work, and ask questions about the specific points that don't make sense. A student realizing their own mistakes is much more powerful than being told where the problem lies.
- Sometimes students will respond well to a more visual representation of what they are dealing with. In these cases, programs like *Mathematica* and *Wolfram Alpha* can be very helpful. This method can help when other attempts to help the student grasp the essential concept have failed.
- If all else fails, doing problems that are similar to the problems they are doing can help them understand the process, as long as you show all steps and explain why you are doing them. Having the student complete some of the steps along the way is never a bad idea.
- Of course, you can always encourage the student to go meet with their professor for additional help during office hours.

2.2 Communicating with Faculty

Different professors have different policies on what is expected from their TAs. You should work with your professor to determine your specific duties for each course.

While you have a responsibility to the students, you also have a responsibility to the faculty member teaching the course. Your professor will not know what you have been doing with your class unless you keep her/him informed. It is important that you communicate with the faculty about what you have been working on with students. If a large number of students have been coming in for help with a specific type of problem, then you should let your professor know. An easy way to keep your professor in the loop is to simply copy them on any emails you send to the class, or just go meet them at a time convenient to you both.

Don't be afraid to ask your professor to discuss concepts that you are having trouble grasping. Professors understand that TAs are also students. In the event that you are unable to help a student with a problem, you should first try to find another TA who can help. As a follow-up, you should visit your professor to get a thorough understanding of the concept. If the problem is that difficult, there is a high probability that other students will ask you about it in the future.

Different professors are best reached in different ways. Typically, the most certain way to reach them is through email. However, dropping by office hours is always a pleasant surprise. Some professors will request a regular meeting time with you, while others won't want to meet unless necessary. The office staff members in the [Science Division office](#) (1st floor CNS) can help you get into contact with any professor. Official mailboxes are located in the Division office, and items can be delivered directly to the office staff.

Chapter 3

Grading

The most crucial part of grading is consistency.

It goes without saying that grading can be the source of a few issues. Consider grading as an opportunity to teach. The point of assigning homework, quizzes, and tests is to provide opportunities for students to develop understanding of the concepts in the course. It also serves as an opportunity for students to receive feedback on their work. Grades can often be an effective form of feedback. You don't need to mark off large amounts because of small mistakes, but you also don't want to give full credit on problems with small errors. Full credit can be misleading, and may cause students to believe that an incorrect solution is actually correct.

Before you grade any assignment you should ask your professor if they have a preferred grading system. This will often be the case. However, sometimes the point scale will be left up to you. An example of a common grading system is setting a fixed maximum number of points for each problem. For example, consider the system shown below where each problem is worth 5 points.

The 5-point system	
Points	Answer
1	Tried but not close
2	Somewhat vaild
3	A little more than somewhat valid
4	Correct with minor errors
5	Correct answer and work

If this is your first time grading, then it can be helpful to ask your professor if it would be possible to grade the first set of assignments together, just to see their specific methods. When you mark a problem wrong, simply placing an **X** where they started making a mistake and writing a brief comment concerning the correct approach can help a student see the essence of the flaw. Marking work as incorrect without any explanation is generally not as helpful for the students as providing some explanation. Remember, the goal of the entire submit-grade-return process is to support the students in understanding the concepts.

Once you understand the methods for grading there are a few things to keep in mind. It is important to remember fairness and speed. This doesn't mean that you should fly through papers, but getting assignments back to the students while it is still fresh in their minds is important. Again, different professors will have different requirements on how soon to get the graded assignments back to them. **As a good rule of thumb, never take longer than one week to return graded assignments.** If you are having trouble keeping up with grading, then discuss this with your professor. You may be able to work out a different grading schedule.

It is also important to remember that grades are personal and confidential. Because of this you should be mindful about where you grade so that graded assignments are not left out in the open. When you turn in the assignments to your professors make sure you either hand it to them directly, or place in under their door in a sealed envelope or some similar method. Talk to your professor about which method of delivery they prefer for graded assignments.

★ Always make sure to keep a copy of the grades for your records. This can be done with Excel, Google Docs, Libre Office, or good-old-fashioned paper and pencil. Finding out at the end of the semester that the graded copies of

Test 2 never made it back to your professor, and that the grades are now lost forever, is a perfectly avoidable situation.

Chapter 4

Advice for International TAs

This chapter is assembled from a compilation of interviews with international TAs in the math department.

First off it's alright to feel nervous. All new TAs will be nervous during their first few professional interactions. Just keep in mind that even if this is your first time having this type of position, you have been recognized as an intelligent and competent person, by the faculty. Which is why they chose you for the job. A contributing reason to you being chosen for this assignment is that someone saw your potential for helping students. TA positions are primarily intended to assist the professor with delivering an effective course, but they are also meant to enhance your professional acumen. Use this opportunity to sharpen your communication skills.

Now upon your first assignment to a class, there are a few questions you can ask of the faculty to help with your adjustment. Can you get a class that is easier to explain to students? This doesn't necessarily mean for the easiest classes, as much as the ones where the ideas are more straightforward.

Another great way to help yourself would be to find two mentors who you can rely on for advice: someone from your home country (if possible) and someone from the U.S. Ask them to advise you in an informal way. If you need help finding mentors, then ask the professor of your course, as they would be happy to help. Ask the U.S. advisor to maybe have a mock session of how s/he helps their students in office hours in order to get an

idea of what you may be able to do to help your students.

Next, approach other international TAs and ask some questions about what you should expect the students to be like. This is information that they will understand better than TAs from the U.S. You will find the math computer labs to be very supportive and friendly environments, especially in the evenings.

When you are helping students, explain to them that you are from another country, and maybe new to teaching. Explain to them that you will attempt to speak more slowly, and will try to write on boards for explanations. Let students know that you would appreciate if they helped correct your pronunciation. If someone asks a question that you can't understand, ask him or her to rephrase the question another way, or write it down so you can get a visual. If a student says a certain step is unclear, try to fill in any missing details at the specific point.

Another important aspect of helping students is learning about the cultural context in which you are teaching. When someone comes to you for help, you will have many assumptions; for instance, about what students are like, how they should address you, how they should ask questions, and how they should dress and act, just to name a few. Many of these assumptions come from the way you were taught in your home country; you will be expecting a similar treatment here. Sadly, this is not always the case. Just remember that while the culture may not be your own, the way you present the material is.

A few advantages to teaching and living in an alien culture:

- You will learn the language, which can help with your studies as well as your teaching.
- If you stay in the country, or go back to your home country, your knowledge of the language will help with future jobs and research.
- And finally, enjoy being a TA. View it as an opportunity to learn about another culture. Have some fun while getting your degree.

Chapter 5

Helping with L^AT_EX

A general guide to using L^AT_EX is available on the math department website [here](#).

One of the best ways to assist students with learning the language is to have them work with you through at least part of the project they came in to get help with. Typically the students who will come in will only need help with small things such as a certain command or help finding an error, but occasionally a student will come in who needs to learn the program from the ground up.

One of the best ways to get such a student started is to pull up an assignment or create a basic document that has the preamble finished for them. That is a document that has the following commands already in the document.

```
\documentclass, \usepackage, \title, \author,  
\begin{document}, \maketitle, and \end{document}
```

Templates are available on the math department website [here](#).

Once students see the basic outline of a L^AT_EX document, try to explain the purpose of each command. Then explain how to add text and math content to the document. It might help to mention that when typing non-math

symbols the program works similarly to Microsoft Word; that is, whatever you type will appear exactly as you have typed it. Then when you need to create some mathematical content, you need to tell the computer to begin interpreting commands in the L^AT_EX language. Explain that one must use the $\$ \$$ delimiters to let the language know where it should be interpreting mathematical code.

When students seem to have a good grasp on how to work with L^AT_EX documents, make it clear that the internet is a vast and necessary resource for specific commands and typesetting troubleshooting. Now you are ready to have them start on whatever question they approached you with. Try to help at the beginning with the commands so that they don't need to look up everything. Also, make sure they remember which slashes and brackets to use, just help them avoid common (but subtle) errors. Always remind students to typeset (compile) the document as often as possible, in order to check for errors and make sure the document saves correctly. From this point forward, it's just a matter of practice.

If a student comes in for a more complicated assignment, such as creating a multiple-file document that imports pictures or other graphics, try using a template. Templates have been created that roughly outline what it is a professor expects in an assignment. Explain how the folders all need to be named as they are linked together and how they need to be placed in the same folder. Some of the commands that are defined for the templates are contained in T_EX files, but there should be some instruction in the comments of those templates that explain where to find the commands and how to edit them without creating errors. When students have a good understanding of how to use the templates, then they usually need help with downloading the correct file types of their images and using the proper commands to import the images into their document. Again if you are unfamiliar with this process, the templates should have quite a bit of information scattered through them in the comments to help out. You can also ask your fellow TAs who have taken the course, or the professor for the course.

Link to the Latex Manual and Templates-

<https://www.iwu.edu/math/StudentResources.html>

Chapter 6

Advice from past TAs

In this chapter, we simply present a collection of suggestions given by some of our all-star mathematics TAs. While they remain nameless, we thank them for their ongoing support of their colleagues in the math department.

-If you are in a room full of TAs, then students won't know who their TA is unless you've introduced yourself to the class. Writing your name and class on a whiteboard near you will make it easier for students to approach you.

-If you need to leave the room for any reason during tutoring hours, then just leave a note on the board saying you'll be back in five minutes so students don't show up just to see that you're not there and leave.

-If you want to hold a study session for students before an exam or if you expect a large number of students, then use room E101: it is a better area for a group discussion.

-Remember to be honest with students and be willing to get help from other places. Resources like *Mathematica* and *Wolfram Alpha* can really help students to visualize what they are trying to do.

-Set up meetings with your class professors. They know what they expect of you so always try to keep in touch even if only by email.

-Let your students know when you have office hours and be sure to be there when you are scheduled, or let them know if you can't make it.

- Make grading of assignments consistent, if you are unsure how to grade a problem, bring it to the professor.
- Maintain a professional manner even when dealing with friends.
- Look at material for your class that you are unfamiliar with before your hours.
- Bring your own whiteboard markers.
- If there is a problem you are unsure of, then get the students' email and try to get in contact with them when you can help them.
- When grading, show the correct work on problems you mark incorrect.
- If you can hold some extended hours before a test and conduct a study session, then your students will truly appreciate it.

Chapter 7

Lab TAs

Lab TAs have multiple responsibilities. Many of these go beyond what the job title of “lab monitor” would typically entail at other places. Part of your job is helping students with technical issues such as L^AT_EX (see Chapter 5), *Mathematica*, and computer glitches; and part of your job is maintaining the computer labs. The same principles that have been presented in the rest of this document apply when you are helping students use various programs for their courses. Your main goal is to help the students understand how to use the software. This is not always accomplished by showing them exactly what code to use. For more information on how to help students who are struggling with certain concepts, software or otherwise, please see Chapters 2, 5, and 6. The focus of this chapter is to address what is expected of you as you maintain the computer labs.

The opportunity is provided, and in some cases required, for lab TAs to become trained and/or certified in different software packages. Below is a table of software packages, along with resources, that are typically utilized by the math department. All software is available in E202, E204, and E210. Python and L^AT_EX are freely available on the web, and *Mathematica* and MATLAB are available for free to IWU students.

Software	Resources
General info	Math department website
<i>Mathematica</i>	Obtaining: Math department website Tutorials: Wolfram website Video tutorials: Wolfram website
MATLAB	Tutorials: Mathworks website
\LaTeX	Guide: Math department website
Python	Tutorials: learnpython.org

On occasion, lab TAs will be asked to present special tutorials on various software packages. For example, lab TAs have given tutorials on *Mathematica* and \LaTeX . While these tutorials are usually intended for a specific course, they are open to anyone who wishes to attend. The tutorials will be prepared in advance; although, it is not out of the question for the lab supervisor or a faculty member to ask lab TAs to participate in the preparation of materials.

Lab TAs are generally assigned to a specific lab or course. For example, there could be several lab TAs assigned generally to Applied Analysis 1 during a given semester; or each lab TA might be assigned to a specific section of a course. In this case, you should work with the instructor of the course to determine the details of your assignment.

7.0.1 Guidelines for Lab Use

For your convenience, here are the Guidelines for Lab Use which are posted in E204.

1. When a class is in session in this computer lab, students not enrolled in the class are not permitted in the lab.
2. Make responsible use of the printers. They are not “free” to the University. You should not print off anything other than class assignments.
3. No food or drink is allowed in the computer lab.

4. The computers in E204 are primarily for use by the students enrolled in mathematics courses who are doing homework for those classes.
5. Other students may use these computers only if their use does not interfere with mathematics course work.
6. Students who are using the computers for anything other than mathematics homework can be asked to logoff when the lab becomes crowded. If you are asked to logoff, please be polite and do so quickly. The student asking you needs the computer for his/her homework.
7. If the lab is crowded and you need a computer to do mathematics homework, ask a student who is not working on mathematics homework to log off. If he/she does not cooperate, you should ask the lab monitor to inform the student that he/she must logoff.
8. Since students may be studying in the lab, please be considerate and keep your voice at a reasonable level.
9. If you are using a computer to play sound files, be considerate of the other students in the lab. Keep the volume to a minimum. If there are headphones available from the lab monitor, use them.
10. If other students are creating a situation that you find intolerable, inform the lab monitor about them and their behavior. (You may first want to ask the students to change their behavior yourself. If they cooperate, then you don't need to inform the lab monitor.)