

Electrical, Computer, and Systems Engineering (ECSE) Teaching Assistant Best Practices Guide

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Communication and Grading Platforms:

Each course will use a different collection of online platforms for course management. This list provides the purpose behind the common platforms used in ECSE courses. There may be other platforms that are used in addition or in place of these platforms.

Piazza: Piazza is a discussion-based platform that allows students to post questions at any time to be answered by course instructors and TAs. Students can also answer other students' questions, allowing for a more collaborative discussion to occur between students in the course and the instruction staff. Resource sharing can also be done here.

Gradescope: Gradescope is a tool to facilitate the grading of assessments that allows for the creation of customized rubrics and team submissions.

LMS: LMS is a multi-purpose tool that can allow for resource sharing, assessment grading, or gradebook management.

WebEx Teams: WebEx Teams allows for the creation of a "team" which can contain multiple spaces that allow students to work together in groups or lab sessions. This is not only a discussion space but a platform that allows for conference meetings.

WebEx Meetings: WebEx Meetings is a conference meeting platform that can be used for lectures, lab sessions, etc. Each user has a personal room that they can open for conferences, or they can create a separate meeting link.

Individual Instructor Websites: Some instructors may have a personal website that they use to share assignments or other pertinent course materials.

Preparing to be a Teaching Assistant (TA):

Upon receiving your course assignment, the most important initial step is to reach out to your course(s) instructor(s) as they will provide the specific information needed for the course and define your duties for the semester.

Familiarity with subject material of assigned course(s):

- It is extremely important to be proficient in the subject material. If you are not, you may need to attend the course lectures or practice lab assignments on your own. You can always work on grading during the lecture if you are already familiar with that topic.

What do you wish you knew before becoming a TA?

- It is not your job to make sure that nobody fails the course.
- That it is alright to not instantly know the answers to every question, as long as you are willing to put in the work to find the solution.
- Being a TA is a good way to challenge yourself to become a better graduate student. Learning how to communicate challenging concepts in a way that people new to the subject

can understand, helps you learn how to frame and communicate your research goals with people that may not be familiar with your area of research.

- If English is not your first language, communicating concepts and developing strong communication skills in your second language can be challenging and takes practice.
- As a TA you have more expertise than other students and you can be more approachable than an instructor. This puts you in a unique position to help students learn.
- Always remember that you are a critical part of the students' education, and you have responsibility to help them learn. Even as a grader, you should be willing to discuss grades with students and help them to understand their knowledge gaps.
- Being a TA is a lot of work and requires attention to detail. Do not expect to be spending just a couple hours a week on this commitment.

Grading:

Fairness and meaningful feedback are the most important part of grading. Designing a rubric and sticking to it is key to achieving these objectives. It helps you to be objective, fair, and gives you an easy way to justify the grades when students inevitably question their grades.

How to create an effective and fair rubric:

- Give partial credit (unless otherwise specified by instructor). Wherever in doubt, discuss partial credit policies with the instructor.
- Assign the majority of points to a conceptual understanding rather than computational accuracy. For example, if the student has the right equation and procedure, but did the calculation wrong, they should get a majority of the points unless otherwise specified by the instructor.
- Divide individual problems into smaller subsections with the key steps the student needs to complete the problem. Assign a number of points to each subsection so that the number of points reflects the importance of the step.
- Make sure to only grade for content which was explicitly required by the assignment.
- When grading be cognizant of hidden biases you might have, whether negative or positive towards a student. To maintain consistent and fair grading, you can:
 - Hide the names of the students you are grading.
 - Keep a list of point deductions to ensure everyone is graded the same.
 - Ask yourself if you would give another student the same grade.

Providing feedback to students:

- Make sure that your rubric items clearly communicate what the error is. This not only helps the student understand why they are incorrect, but it helps to remind you of why you took off points if they ask you to review it with them at a later time for a regrade request.
- Most online grading platforms provide a comment box in addition to the rubric. Utilize this comment box to your advantage, as it can help you elaborate on problems the student had in their submission that the rubric may not be able to explain completely.

- It is important that homework and exams are graded in a timely manner. Typically, it is expected that an assignment will be graded within a week from when it is due. Discuss the grading deadlines with the instructor, as it may vary across classes and across instructors, and also the time of the semester (e.g., final exams may need to be graded right after the exam).

Lab Checkoffs:

- Each student should have to discuss or answer questions during the checkoff. Ensure that you do not allow other students to answer a question directed at a different student.
- During checkoffs where a student may be struggling to answer a question, encourage students to demonstrate their knowledge by showing you where to look up relevant information in a datasheet/lab manual/their code.

Communicating with students:

Many students may be uncomfortable asking for help. By being accepting and understanding, you are creating a positive environment that allows students to feel comfortable asking questions during class, lab, etc.

Always maintain a constructive tone when interacting with students. This is especially important when a student can insist on requests (e.g., regrading) that the TAs do not find reasonable. The TAs, while decisive in their opinion/decision, should maintain a constructive tone in communicating.

Setting Expectations:

- You establish a standard of expectation with the students early in the semester. Be careful with “giving points back” on homework or exams, or agreeing to meet with students outside office hours as this will lead to students expecting the same treatment for the rest of the semester. You should strive to be consistent and fair with all students.
- Provide feedback on assignments early in the beginning of the semester. Communicating your expectations for what qualifies as a satisfactory lab report, for example, allows students to make changes for subsequent reports to improve their quality of submissions. How you grade the first homework/assignment sets the tone and expectation for the course.
- If the students are allowed to self-pace their work in a course, it is important to encourage students to keep moving. The best way is to provide a schedule with suggested deadlines.

Answering Conceptual Questions:

- Practice looking at problems and concepts from multiple perspectives. Students can have very different ways of understanding the world and presenting the material in a different way can help them. For example, some students need written, mathematical explanations while others need pictures and diagrams.
- Try to understand how the student thinks about the problem by asking them, “Walk me through how you approached the problem.”

- When students ask if their answer is correct, help them assess their answer by asking them, “What do you expect the answer to be, and why?” Help them develop an intuitive sense of the system and teach them ways to check their answers such as unit analysis. Avoid giving them the answer or immediately telling them if their answer is right or wrong.
- Often, students get stuck on a problem because they are unsure of themselves and not because they do not know the answer. In this case, encourage students to make a guess and see if it works.

Office Hours:

- You will likely find yourself with one or two students who will constantly ask for your help and try to take as much of your time as possible. It is important to balance the amount of time you spend with a particular student so that you have time to help other students and fulfill the rest of your TA duties.
- If there are many students that have similar difficulties with a problem, create a group with the students and work through a problem together. WebEx Teams is useful for this. This builds a community among the students. Students that understand the steps you have explained, can then reinforce their learning by teaching other students in the group how they solved the problem. This allows you to make sure that you can work individually with each student but that the group as a whole continues to make progress.
- If office hours are not attended by students, use this time to grade or work on future labs for the course. If you use the time you have budgeted for this class to your advantage you can save yourself time overall.

Interacting with the Course Instructor and teaching staff:

Communication is extremely important and you as a TA have to understand that you are not doing the work alone. The instructor and other TAs are a treasure trove of knowledge and will help you out whenever possible. Remember you are a team!

Communication with the Course Instructor:

- Maintain good communication with the professors you are working with. If you are falling behind in your TA work, communicate with them early so you can get back on track as quickly as possible. This is always better than avoiding communicating the issue.

Setting expectations with the Course Instructor:

- Be clear about the expectations for when assignment grading should be completed
- Academic dishonesty violations (plagiarism/cheating) are more widespread than you might think. You may have to deal with this even when an instructor is not present (such as while proctoring an exam). Be sure to discuss with the instructor what to do with these cases as they arise – different courses/instructors will have different specific policies.

- It is critical to give students correct information, especially with regard to requirements for assignments. Make sure you are on the same page with the other TAs and the instructor.
- Communicating with the other TAs and the instructor is critical in establishing a standard for grading. It is your responsibility to make sure you are grading as expected.
- If your TA duty is taking significantly more time than the assigned TA hours, you should bring that to the instructor's attention. If that issue remains unresolved after discussion with the instructor, you should bring that to the attention of the graduate program director.

Communication with other Teaching Assistants:

- If you encounter anything that you do not understand, use your fellow TAs as a resource.
- If you are working with TAs that are experienced with laboratory components that you are unfamiliar with, shadow them as they debug problems and ask them questions. You can learn a lot this way.
- Be flexible and work as a team with the other TAs to improve the experience of both the students and teaching.
- Some course instructors will allow for TAs to trade assignments for periods they anticipate having significant other commitments (ex: research deadlines, travel, graduation, qualifying exams). If allowed by your course instructor, coordinate in advance with your fellow TAs to address such circumstances.

Communication with Undergraduate Student Assistants:

- If there are undergraduate student assistants in your course, help to mentor them by working to increase their confidence in troubleshooting and guiding/answering their peers' questions in a laboratory environment.

Balancing TA, research, and coursework responsibilities:

Proper time management is essentially in balancing all your responsibilities. Finding the best routine that works for you may take several iterations.

Time management and organization strategies:

- Try to set aside specific days to work on each area as best you can. For example, if your TA duties occur primarily on certain days of the week, try to grade on those days also. This will help you to free up larger blocks of time for coursework and research duties. Try to protect that time on your calendar, just like any other scheduled meeting.
- Make a schedule/designate time for TA activities. Keep office hours as TA time and work on grading while you are not helping students.
- Expect and plan for a larger distribution of your 20 hours of TA work to be spent proctoring and grading when exams are being held.
- Planning the entire week on Sunday nights and planning the day the night before makes it a much easier to accommodate all aspects of PhD life.

- Finding your own rhythm is extremely important and the sooner you identify it the better. For example, if you work better during the early parts of the week, schedule research and classes during those times.

Preparing for a course with a laboratory component:

Preparing for the lab:

- Look at course material and any relevant lab sheets or manuals well ahead of time. If you will run a lab, read the lab ahead of time and make sure you understand the assignment. If time permits, run through the lab yourself to understand common issues the students will run into (it takes more time, but is much less stressful!).
- Become familiar with the hardware and software components the students will be using as soon as you can. Ask the course instructor if there are any spare hardware components that you can borrow to work on future labs.

Troubleshooting with students:

- In early labs, even if you are inexperienced, engage early in debugging issues students are having. This is the perfect time to learn the common issues that are encountered with hardware/software and will help you learn how the lab components work. The more interface time you have with lab equipment as early as possible, the easier it will be for you to work with students in later labs that have more complicated issues.
- Whenever you directly help a student debug their code or hardware, say out loud how you are debugging so they can learn the process.
- Teach students how to read error messages to help them learn how to troubleshoot their own code.
- Encourage students to become familiar with reading a specification sheet. This can help them understand a lot about the component they are using and how to wire it properly

Technical issues:

- For any courses that involve building circuits:
 - When debugging circuits, always check current of the DC source and the power/ground connections to the ICs.
 - Encourage the students to use a unique wire color for power/ground that is separate from other signals.
 - If you have not found any conceptual errors or wiring errors in the circuit, check that the components are working as expected. Some common issues include broken IC pins or shorts in the breadboard.

- For any courses involving software:
 - Install any software you may need prior to the lab so that you are familiar with the installation process. Installation issues are common for students at the beginning of the semester.
 - Become familiar with common syntax errors as early as possible.
 - Make a note of any particularly complex errors and how you solved them, so you know how to address these issues if you encounter them again.

Resources available for Teaching Assistant concerns:

If you have concerns regarding the work environment of your TA assignment that cannot be addressed or resolved with your course instructor, there are members of the ECSE department that you can discuss your concerns with confidentially.

Confidential contacts:

- Kelley Kritz: Graduate Program Administrator
- Professor Abouzeid: Graduate Program Director
- Professor Dutta: Master's Program Director
- Professor Lu: Curriculum Chair