

THE UNIVERSITY OF  
CHICAGO

DEPARTMENT OF

CHEMISTRY

# Guide for Teaching Assistants

Department of Chemistry  
The University of Chicago



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## Preface

Welcome to the Department of Chemistry at the University of Chicago. One of the goals of our graduate program is to produce exceptional teachers as well as excellent researchers, and this guide is designed to help in that. It will provide you with policy information and help you improve as a teacher. It should also serve as a touchstone later in your studies as you strive to reach your full potential as a teacher.

This guide is intended to familiarize you with your teaching responsibilities for General Chemistry and Organic Chemistry as well as provide you with specific information for the teaching role that you will perform. The information provided in this guide will also be valuable to experienced Teaching Assistants, as it provides a summary of the important policies in the teaching laboratory.

Teaching Assistants have a serious responsibility within the Chemistry Department. A large portion of the individual attention and instruction for students in chemistry classes depends on the knowledge, concern, dedication, and initiative from the Teaching Assistants. You have the chance to directly influence students' attitude toward the Department and their performance in chemistry courses, as well as their career choice in the future.

As a Teaching Assistant you will have a great opportunity to practice your teaching skills and benefit from your teaching experience. If you choose a career in teaching or research, the ability to effectively communicate your scientific work with other professionals and the general public may be vital to your success. Therefore, the role of Teaching Assistant has the potential to significantly affect your personal and professional development.

The quality of your teaching is largely dependent on your attitude and ethics. Your view of the role as a Teaching Assistant will fundamentally determine the effectiveness of your teaching. To be a good Teaching Assistant, you need to take pride in your teaching, be a good role model for students, and take initiative when it is needed.

We hope that you will enjoy teaching at the Department of Chemistry and find this Guide for Teaching Assistants useful now and in the future. It is our goal to help you have a gratifying experience as a Teaching Assistant and a graduate student.

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## **I. Introduction**

### **A. Mission**

Our mission is to train and support graduate students as teachers transitioning to researchers through the development of their teaching, speaking, writing, problem-solving, and other career building skills. We strive to develop a supportive, professional community with positive mentor relationships.

### **B. Goal**

Our goal for teaching in the Department of Chemistry is to ensure that the students gain a strong foundation of chemical knowledge through independent application of concepts in problem solving both in the laboratory and in written work.

This guide is intended to familiarize first year graduate students of the Chemistry Department with their teaching responsibilities and to provide them with specific information on the performance of their duties. The information which follows will also be of value to experienced Teaching Assistants as it provides a summary of the more important aspects of the operation of the teaching laboratory.

### **C. Responsibilities**

As a Teaching Assistant, you have a very serious responsibility. A large portion of the individual attention and instruction for undergraduates in chemistry classes depends on the knowledge, concern, and dedication of the Teaching Assistant. Your close contact with students will directly influence their attitude toward the department and their performance in their courses. It is vital that you take this responsibility seriously; you will be the face of the Chemistry Department to your students.

As a Teaching Assistant for the Department of Chemistry at The University of Chicago, you have the following responsibilities:

#### **1. Attend Weekly TA Meetings**

These meetings are mandatory. The Laboratory Director will discuss important information regarding the upcoming labs. The lecturing faculty member may also provide information about the overarching course.

#### **2. Lead One Lab Section Each Week**

Responsibilities for leading the lab include:

- arriving at the lab 15 minutes before class is scheduled to ensure that everything is ready for the students when they arrive;
- demonstrating and teaching students about new equipment and techniques;

- interacting with students as they complete their experiments and troubleshooting when necessary;
- proctoring the lab until the last student is finished;
- making sure that the lab is left clean and orderly with common equipment returned to where it belongs and instrumentation turned off;
- securing the laboratory before you leave.

**3. Lead One Discussion Section Each Week**

Responsibilities for leading the discussion include:

- arriving at the classroom 5 minutes before class is scheduled to ensure that everything is ready for the students when they arrive;
- giving the students important information about the upcoming lab;
- reviewing pertinent topics from lecture;
- handing back graded assignments.

**4. Grade Assignments for Your Lab Section**

This includes prelab quizzes, notebook copy pages, lab reports, homework, and any other assignments given by the teaching faculty. The turn-around for grades will be one week from the time the assignment was collected. You will be responsible for recording and reporting all grades to the Laboratory Director.

**5. Proctor and Grade the Midterms and Final Exam**

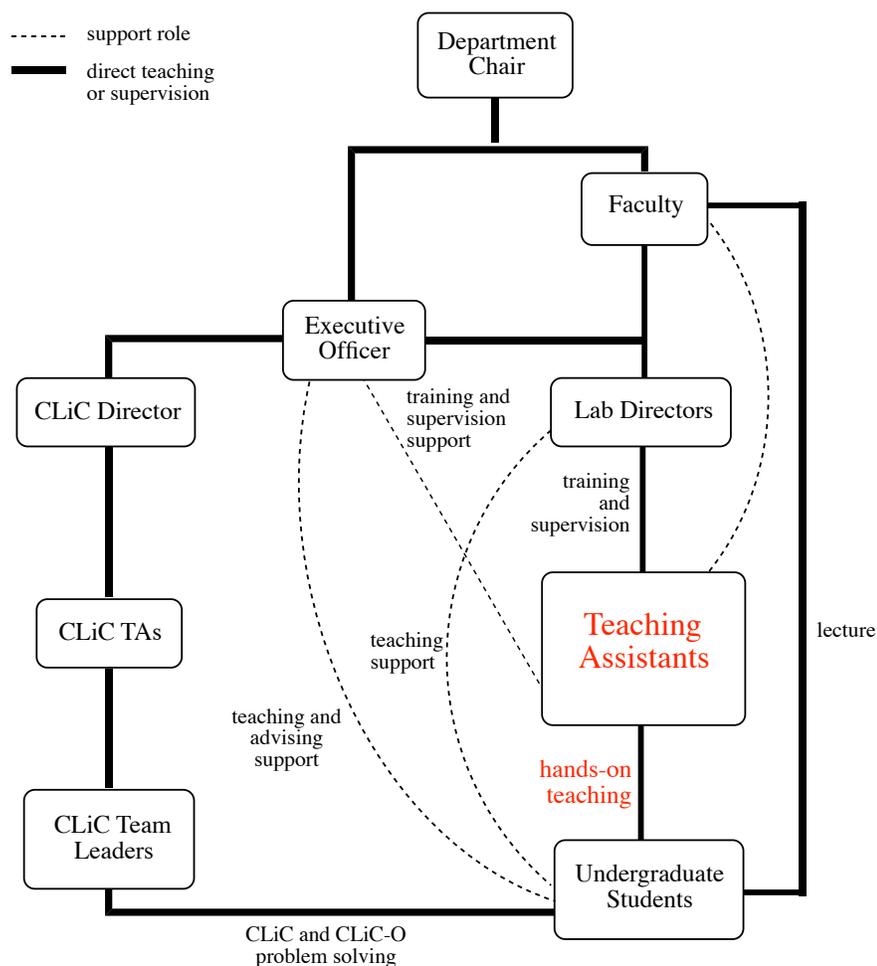
**6. Hold Office Hours for 2 Hours a Week**

**7. Attend Class Lectures**

**8. Be On Call**

One week each quarter you will be required to be on call. You may be asked to fill in for a sick TA or help the Lab Director.

## D. Personnel chart



The Collaborative Learning Program (CLiC/CLiC-O) personnel include the Collaborative Learning Director, upper level graduate Teaching Assistants, and undergraduate Team Leaders. It serves a supporting role to the overarching chemistry courses.

## **II. General Information**

### **A. Schedule**

Every attempt will be made to provide teaching assignments before classes start each quarter. Assignments will be adjusted as much as possible not to interfere with your own classes or schedule. It is your responsibility to communicate any schedule conflicts to your Laboratory Director. Personal preferences or seminar attendance cannot be accommodated.

### **B. Supplies**

You will receive keys, textbooks, goggles, gloves, and a lab coat for your teaching assignment. If you will not be teaching the following quarter, you must return your keys and textbooks to the Laboratory Director at the end of the quarter.

You will be provided a code that allows you to make photocopies on the departmental copiers. Photocopies should be made for instructional materials only. There is a copier available between Kent and Jones on the third floor.

### **C. Grading**

A grading scheme for each lab report and homework assignment will be given to the Teaching Assistants to follow when correcting students' work. It is important that the point distribution is carefully followed. Deviations from the grading schemes lead to significant variations in scores. At the end of the quarter, all scores are normalized, which affects the equity of a student's grade if the scheme is not followed.

No matter how detailed a grading scheme is, it cannot predict every type of answer you will encounter. The best way to grade assignments is to look at a few before assigning points. This way you will have a feel for how to distribute partial credit before marking your students' papers. Keep a record of how you distributed partial credit so that all assignments can be graded fairly and consistently.

Each TA will be given a grade sheet for recording grades. Always keep the grades and graded work in your possession or in a secure place. Do not leave it where your students can gain access, such as your TA office. Under federal law (FERPA), you cannot disclose a student's grade to a person other than the student or the instructor(s). Return assignments so that scores are not visible to others.

Every week in lab, as you return graded lab reports and homework, you will submit those grades to the Laboratory Director as well. You must keep your grades up to date. The students learn from their mistakes and the sooner they see their graded work, the sooner they stop making the same mistakes.

At the end of each quarter, the Teaching Assistants must also give each of their

students an evaluation and an evaluation grade (worth one lab report) based on the performance of the student. This is an opportunity for a student who has a good attitude and works hard, but runs into unfortunate circumstances in the lab, to earn credit. The evaluation points are up to the TA's discretion. Further details are provided in Section IV, Part C. You might consider setting your criteria for discretionary points at the start of the quarter and conveying it to students. A copy of the Student Evaluation Form, to be filled out by the Teaching Assistant, can be found in the Appendix.

Teaching Assistants must not attempt to predict a student's final letter grade in the course, but should refer the student to the professor. Students wishing to withdraw from the course should be referred to the professor and the laboratory director. Changes in midterm examinations can only be made through the Laboratory Director or the professor.

## **D. Guidelines for Proctoring**

### **1. Passing Out the Exams**

Before you pass out the exams, make sure all books and notes are put away. Count the number of students in a row and pass out only that number of exams. Do not just give them a stack of exams; this is how exams go missing. Once all the exams have been passed out, start all students at the same time. At this point, count the number of students and the number of extra exams and that should be the number of exams you started with. If there is an exam missing, walk around and see if it can be found. If needed, make an announcement. The reason for this is students have put blank exams in the bathroom or another classroom and filled in the blanks while out to the bathroom. The exams are also passed down from student to student.

### **2. During the Exam**

Do not bring your computer. Your responsibility is to watch the students. Walk around, and be sure to pay attention to students sitting in the back. If you suspect a student of cheating, you have every right to let that student know. Do not accuse them of cheating, but telling them to keep their eyes on their exam will give the message. If there is any physical evidence of cheating (cheat sheets, writing on their hands, cell phone pictures, etc.), confiscate it. Also, obtain the name of the student and alert the Laboratory Director and Professor.

### **3. Collecting the Exams**

When the time is up for the exam, let the students know and be proactive about collecting the exams. Some students will only stop taking the test when you take the exam from them. Promptly collect exams, since students have been

known to discuss questions and change answers on the way to turning in the exam. Before you leave the room, count the exams again to make sure no one has taken an exam home. Unfortunately, every year there is at least one incident to remind us that some students do commit academic dishonesty.

## **E. Teaching**

Each week you will have seven hours of contact time with your students as outlined in the responsibilities section of the introduction. This splits into four hours of lab, one hour of discussion, and two office hours.

The details for teaching lab are in Section IV. Due to safety considerations, this is one of the most important part of your job. Lab is a hands-on exercise, and it is imperative that students receive excellent instruction. The laboratory experience expands upon information that is introduced in lecture, and puts lecture concepts into practice.

Every week you will hold a discussion session, as detailed in Section V. This is a good time to relay important information about the upcoming lab and to review lecture topics.

You will have two hours of office hours every week. Office hours are designed for one-on-one instruction with students in your section as well as others in the class. This is an opportunity to review concepts for individual students that may not be appropriate for group discussion.

While you are a Teaching Assistant, performing other teaching roles within the University, such as tutoring, may present a conflict of interest and thus are not allowed. These opportunities are available upon the completion of your role as a Teaching Assistant.

## **F. Evaluation of Teaching**

Teaching Assistants are evaluated quarterly by their students and the Laboratory Director. Standard questionnaires are used, and a copy of both evaluations can be found in the Appendix. The results are reviewed and tallied by the Lab Director and then sent to the Executive Officer. Each quarter, the faculty will receive a complete teaching evaluation for each TA. If your performance is determined to be unsatisfactory, a mid-quarter meeting with the Executive Officer and the Chair of the Department will be scheduled.

There are two opportunities for you to evaluate and to be evaluated by your peers on your teaching abilities. The first is during TA training where you will give a practice discussion session in front of the other first year graduate students. The discussion evaluation form that is included in the Appendix is what will be used in that setting. Then in the winter quarter, there is a one-on-one peer observation opportunity where TAs observe each other teach. This session is structured as part of the year-long

Graduate Training Course and is designed for TAs to help each other improve their technique and style.

At the end of the academic year, departmental and college-wide teaching prizes are given to those TAs who have made the greatest positive impact on their students. Student nominations for these prizes are weighed most heavily.

### **III. Attitude and Ethics**

#### **A. Attitude**

Your attitude towards teaching impacts your students' attitude towards the class. In the classroom, your carefully thought-out and clearly expressed comments will evoke similar behavior by your students. You are in graduate school because you are passionate about the field of chemistry, and channeling this excitement into your teaching is a powerful tool. You are in a professional role as a Teaching Assistant and your attitude should reflect this.

An extremely valuable attribute of a good teacher is enthusiasm, which is second only to having a thorough grasp of the subject matter. If your students sense that you know what you are talking about, that you find chemistry an exciting discipline, that you take pleasure in the learning that they achieve, and that you grade fairly (giving credit where credit is due), they will respect you as a good teacher and chemist; even though chemistry may not be their main interest.

While computers are an important tool in regard to teaching, they are also a large distraction and can show the students that their responsibilities (i.e. lecture, lab, exams) are not important. Bringing your computer to lecture for non-class purposes, such as email, shows the students that it is not worth your time to pay attention and sets a poor example. Looking at your personal computer in lab is a safety issue because you are not concentrating on what is happening in the lab and it indicates that the students are not your top priority. Personal computers detract from your focus, which needs to be entirely on your students at all times.

#### **B. Ethics**

If you are respectful in your relations with your students, they will be respectful of you. If you are cold and sharp or condescending in the discussion of their work or difficulties, they will feel uncomfortable and have as little contact with you as they can. Although you will want to be friendly with your students, you must remember that you are not one of their peers. You cannot be one of the gang with them on Saturday night and then be a fair mentor Monday morning. Nor can you play the romantic lead one night and be an impartial teacher the next day. You can learn to be on friendly terms with your students academically without becoming involved in their personal lives and problems. This extends to social media as well. It is the

long-standing policy of the University to forbid dating students in your classes. This policy will be rigidly adhered to.

*Punctual attendance at all discussions, lab sessions, and meetings is required.* Your students will look up to you as one who sets and maintains academic and social standards. If you are absent, you may fail to receive important instructions, which you need in order to be effective. Chronic tardiness or absenteeism will lower the regard accorded you by your students, your colleagues, and your supervisors. Absence from any scheduled session is inexcusable unless you have made prior arrangements for someone to take your place. Always let the Laboratory Director know of the conflict as soon as possible. You must be on time for teaching assignments, which means 15 minutes before the start of class.

Following the rules is important for student equity. You may think that you are giving your students a break, but it also opens the door to allowing an extension to all other students in the class. Your relaxation of the rules makes it difficult for the other TAs to ensure that all students are treated the same. This also sets a precedent for the students to ask for extensions and exceptions.

Be sure that you clearly and fully understand the current course material and how you are to handle it in the laboratory and discussions, so that your discussions will align well with the lectures. There is nothing more demoralizing to a student than to be told to follow one procedure or method by the faculty member and then get quite different instructions from the Teaching Assistant.

It is highly recommended that you bring practice problems for students to solve in discussion and review sessions. However, if you have access to problems written by a faculty member, for example old homework or exams, you must obtain permission to use it with your students. Faculty sometimes reuse problems in order to gauge the performance level of a class and want to keep their problems confidential. Always cite your source when using published problems - this shows your students that you take proper citation seriously and gives credit to the person who wrote the problem.

If you find a situation that you think needs correcting, tell the Professor or Lab Director about it so it can be addressed. As shown in the personnel chart in Section I, Part B., we are all integral to the success of the Kent undergraduate laboratory operation, and everyone must be treated with respect. Treat the Lab Manager and Technician with respect, they are part of the team too. Do not complain to the students about the course material, bring the issue to the Laboratory Director for resolution.

## **IV. Laboratory**

### **A. Laboratory Check-In Procedure**

At the TA meeting for the first week of lab, you will receive a detailed procedure describing what needs to be done for students checking into the lab. Get to lab 15

minutes before the start of class to prepare. Steps include:

**1. Take Attendance**

Students should check-in with you first. Remember to TAKE ATTENDANCE! You will be given a roster of student names and ID numbers. Please call the roll. Watch for stragglers. If a student is not on your roster, they should not be in your lab room. Send the student to the Lab Director. Never give permission for a student to join your section. All section changes must go through the Lab Director.

If you haven't done so already, introduce yourself and then start the safety training.

**2. Safety Training**

Each student should have a safety training booklet to follow as you go through the safety briefing. Students may not take the booklet home with them. The booklets will be kept in lab rooms for future reference.

The Lab Director may send in students to take the safety training that may not be in your section or on your roster. Do not assume these students are added to your section. If the student is not on your roster, they should not be in your lab room in future weeks. Send the student to the Lab Director.

At the end of the safety training, students must fill in the Safety Compliance Form. Leave the Safety Booklets and the Safety Compliance Forms in the lab.

**3. Assign Lab Drawers and Keys**

Since you have already gotten to lab early, the first thing you should do is to count the keys. After you have taken attendance, pass out the keys one by one to students as they tell you their names. Never let the students grab their own keys. This results in stolen keys and unauthorized students checking into drawers. Hand out keys so that the center bench drawers are used last. Leave your roster with the key numbers recorded in the lab.

**4. Equipment Check**

The equipment list is included in the student lab notebook. Students should check all lab equipment in their lab drawer against the equipment list. Any missing or broken equipment should be replaced before lab starts. Missing glassware may be obtained from the Lab Tech in Kent 310. Any other extra equipment must be turned in and put in the LOST/ FOUND drawer.

The common items located on the central bench are for all sections to use. Students cannot keep these items in their drawer. If any common item is broken during the experiment, the TA must inform the Lab Director.

## **B. Laboratory Supervision**

### **1. Be Prepared**

Before coming to the laboratory, study the experimental procedures in the Laboratory Manual and the TA meeting notes which the Lab Director has distributed at the weekly Monday TA meeting.

### **2. Arrive Early**

TAs must report at least 15 minutes prior to the beginning of the lab and ascertain that the necessary chemicals and equipment are available. TAs should turn on the ventilation system for the chemical fume hoods before every lab session and turn it off after all students have left the lab.

### **3. Goggles**

The TA and students **MUST WEAR SAFETY GOGGLES** in the lab **AT ALL TIMES**. Safety goggles are mandated not only by the University Safety Office, but also by Illinois State Law. Only goggles approved by the Safety Department and issued by the Chemistry Department are allowed in lab.

### **4. Walk Around Lab**

Once class routines are established, you are likely to spend the majority of your time answering questions. Do not remain at the instructor's desk. It is important to observe the students in their actual performance of laboratory work. Effective teaching in the laboratory requires continuous contact with the students and their work. Make a definite effort to visit every student at least once during each laboratory period. Other activities beyond lab teaching will not be allowed in lab, e.g. using computers, grading students' homework and lab reports, reading newspapers and/or research papers, etc.

### **5. Be an Active Teacher**

Watch regularly for opportunities to give help in developing good laboratory techniques and safety. For example, the need to keep the front sashes of the fume hoods at the appropriate levels or the need to keep corrosive chemicals away from balances and other special apparatus. Occasionally, go from one student to another to ask questions concerning the experiments. For example, ask what the student is doing, and expect an answer without consulting their notebook. Challenge them to explain why this is an important step in the laboratory procedure or explain what reaction is occurring.

### **6. Notebooks**

It is required that TAs ask to see the students' written record of data and observations as recorded in their lab notebook. Many TAs check the notebooks as students walk into lab to see if they are prepared. Students' lab notes must be written directly into their notebooks and the TA needs to make sure that the students record their own observations. The TA will collect the carbonless copies of their students' notebook pages every week at the end of each lab.

If time permits, the TA may occasionally ask questions about the experiment or discuss the quality of the students' work. Such procedures can help to discourage hurrying through the performance of the experiments in order to leave the laboratory early.

#### 7. **Supervision**

The Teaching Assistant is responsible for all of the students in the room. Do not allow a student from another section to work in your laboratory, unless a permission slip is obtained from the Laboratory Director. The TA, as well as the students, should be in the laboratory throughout the period. **AT NO TIME SHOULD THE STUDENTS BE LEFT ALONE IN THE LAB!** Students should not be allowed to leave the laboratory before they finish the experiment without permission from the Laboratory Director, nor to wander around and visit. Students completing their work early must continue wearing safety goggles until they leave the laboratory.

#### 8. **Be Focused**

The laboratory is not a time to relax, to grade papers, or to study for your own courses. Laptop computers are not to be brought into lab. Use of cell phones or other personal electronics is also prohibited.

#### 9. **Student Belongings**

For safety considerations and to prevent chemical contamination, students should not be allowed to bring their backpacks, coats, electronic devices, and personal items into the lab. Lockers are available outside the lab for their personal possessions. Students must provide their own locks. Many items have been stolen over the years, so students should either not bring valuables or ensure that they are locked properly.

#### 10. **Clean the Lab**

Keeping the laboratory clean is an important part of the TA duties. During the quarter most of the cleaning tasks must be done by the students – you should make your students aware of this fact. One effective way of encouraging cleanliness is to make sure each student has cleaned and wiped down their hood and benchtop area before you accept their notebook copy pages.

When chemicals are spilled, the student is responsible for cleaning up after themselves to the best of their ability. In the event of a major spill, the TA will assist the student in cleaning it up and informing the Lab Director. You should be especially certain that the balances and other common areas are kept clean. **EACH TA IS RESPONSIBLE FOR ENSURING THAT THE LABORATORY ROOM IS CLEAN FOR THE NEXT CLASS.**

#### 11. **Waste**

The proper disposal of waste chemicals is an important moral and legal obligation of the Department. You must pay close attention to the details for

waste disposal procedures presented in the lab manual and at the Monday TA meeting. In the event that a waste bottle becomes full, contact the Lab Director to obtain a new one.

## 12. End of Lab Day

The TA is to remain in the laboratory room until the last student leaves. The TA must check for open water, gas, nitrogen, vacuum, and air outlets before leaving the lab. All balances and instruments must be turned off, and the instrument room must be secured. Check the hoods for any undisposed waste chemicals or broken glass. Collect all glassware left behind and return common equipment. Finally, turn off the lights and hoods and lock the lab door.

## C. Grading

### 1. Assignments

- a. Prelab Quiz (O-Chem only) – This is a short quiz given to the students before they perform the experiment. They may use only their prepared notebooks as a resource. This quiz will determine their preparation and understanding of the lab that they will perform.
- b. Notebook – The TA must check every student's notebook to ensure that they are prepared for the experiment. At the end of each lab period, the student will turn in their carbonless copies of their notebook pages for the day's lab experiment.
- c. Lab Report – These must be printed reports that show results and a discussion of the experiment.
- d. Discretion Points – The TA will give every student an evaluation grade based on their performance related to following safety rules, pre-laboratory assignments, technical skills, notebook preparation, housekeeping duties, general laboratory demeanor, participation during discussion sessions, etc. For example, if a student needs daily reminders to wear their goggles in lab this can be figured into their lab grade by reducing their discretion points.

### 2. Lab Reports

Lab reports are due one week after the completion of an experiment. The reports are to be handed in as the student walks into the lab at 1:30 p.m. Any labs accepted after 1:30 are considered late. There will be a daily late penalty. Late lab reports must be turned in to the Lab Director.

### 3. Grading Scheme

TAs will be given a grading scheme for all reports, prelabs, and notebook copy pages. The grading scheme itself must not be left out on your desk or in your lab. These are confidential documents and must be treated as such. Do not distribute the grading scheme to students or post it online. Students have stolen

grading schemes in the past.

**4. Mistakes**

Clearly mark on lab reports/notebook pages why points were deducted. This is how the students will know what mistakes not to repeat. Refrain from writing unnecessary comments on student's work and give constructive feedback

**5. Turn-Around Time**

Graded lab reports must be returned to your students within one week. This is to ensure that mistakes are not repeated unnecessarily.

**V. Discussion Sessions**

**A. Before Meeting Your Class**

**1. Be Prepared**

Not even the most experienced and best teachers try to teach without preparation. Do the assigned problems. A problem may look simple and straightforward, but there are few moments more embarrassing than being unable to do an assigned problem when you are standing in front of a class. Do the problems thoroughly before going to class.

**2. Be Punctual**

You can't expect your students to come on time if you are habitually late. The time allotted for discussion is short and your students should have the benefit of instruction for the entire period.

**3. Think About Your Appearance**

Dress as if you care about the discussion section and have prepared for it. You must appear in charge of the class if you hope to maintain control in the classroom. Remember, all eyes will be on you.

**4. Be Aware of the Time**

Some of the discussion rooms may not have clocks. If you are going to use time effectively, you must know how much time remains in the class period. Students have busy schedules, so respect them by ending class on time.

**B. Attitude and Conduct**

**1. Be Enthusiastic**

Project a positive attitude toward your students and the subject. If you have a criticism of the way the course is being taught, see the Lab Director – do not complain to the students. Don't be cynical and negative.

## 2. **Set High Standards for Your Students**

The students will rise to the standards you set for them. Be positive, treat them like the talented people they are, and encourage them to live up to their potential. This may sound corny, but it is important and harder to do than you think. If you think the students have no hope of really learning much chemistry, this will come through to the students. These students are training to be future scientists and healthcare professionals, so precision, accuracy, and thoroughness are expected in their work.

## 3. **Professionalism**

You are part of the teaching effort. Be sensitive and sympathetic toward the students, but do not try to be “one of the gang.” You need to keep some separation between yourself and the students to keep your objectivity. On the other hand, don’t flaunt your authority. You can be firm and maintain high standards and still remain compassionate and professional towards your students.

### **C. Handling a Discussion**

#### 1. **Learn Your Students’ Names as Soon as Possible**

Call on the student by name. This will help create a safe environment where the students feel part of a learning community and valued. They should be personally involved in the learning process.

#### 2. **Speak Clearly and Loudly**

Make sure your voice can be heard. Face your students instead of talking to the board.

#### 3. **Use the Chalkboard**

Be sure to write legibly on the board and large enough to be read from the back of the room. Do not erase something before your students have copied it down. Be careful not to stand in front of your writing.

#### 4. **Engage Your Students**

The discussion provides an opportunity for students to participate. Encourage all students to participate by calling on them by name. Do not let one or two students dominate every discussion. To encourage the more reserved students to participate, you might pose a question and ask students to discuss the answer with a partner before sharing with the class.

When you ask for questions, do so in a way that makes the students feel that you really welcome questions. By referring to specific material where you know problems are occurring, you can get more engagement than just asking “Does anyone have questions?” Asking a question that requires more than a yes/no response encourages students to think more deeply about the material. For

example, you might ask “what is the most challenging part of an acid/base problem?” After you have answered a question, ask the student if something is still unclear. Be involved.

#### **5. Be Open and Honest**

When a question arises for which you do not know the answer, say “I don’t know” and find the answer before the next meeting. Do not try to bluff. You will look bad, and worse, the students will get incorrect information.

#### **6. Structure Your Discussion**

In your discussion, be very clear about what you are presenting. Writing key points of the problems on the board and carefully labeling parts of the discussion will keep the students engaged. As you proceed with a class, make transitions very clear. Summarize points in advance. Verbal teaching requires organization, simplicity, and repetition. Don’t be afraid to be simple and direct. Make sure students understand which concepts are crucial. Your students are pragmatic about the course. They have heard that chemistry is hard and they want to know what will help them succeed. It is your responsibility to help them with this.

### **VI. The Learning Process**

#### **A. First Impressions**

On the first day of class you may be nervous and uncertain, but it is in your best interest to project a positive attitude to your students. The students expect competence and confidence on the part of their teachers. It is very important to be especially well prepared on your first day of class, so make sure you read all class material and review the notes from TA meeting. First impressions are important.

Teaching is a very rewarding and fulfilling experience. With the right attitude and preparation, you will soon realize that you have an ability to guide your students to their potential and beyond.

#### **B. Think About the Learning Process**

Although you may never have taken a course in the psychology of education, you have a great deal of experience in the field. You have been a student for over fifteen years, so think about your experience as a chemistry student. Reflect on why some teachers were very effective and others very ineffective. Your long experience as a student provides a good foundation for your role as a TA. Spend some time thinking about the learning process.

### **C. Learning Outside the Classroom**

As a teacher you are not in the classroom to feed information to the students. You are there to guide the students and lead them toward the correct path. Make sure the students are aware of this as well. Remind yourself that most learning takes place outside the classroom. You may have students who want you to learn for them, however that is not your mission.

### **D. Be Adaptable**

Students' attitudes and motivations are constantly changing. Be aware of this and try to use it to your advantage. For example, as an exam approaches, it becomes much easier to focus the students' attention. Also, knowing that the majority of your students are interested in other fields, their interest in chemistry will rise when they are shown how concepts are related and applied to their interests.

Chemistry is important because it provides excellent general training for the mind. In order to solve a problem in chemistry, a student must be able to think critically and creatively and must be careful and logical. Problem-solving is a skill which is highly useful to anyone: scientist, doctor, attorney, laborer, etc. Many curricula that require chemistry do so not only because chemical knowledge is important, but because chemistry as a discipline provides an excellent vehicle for learning to think critically. You should be aware of this as you teach and should point it out to your students often. Teach in a way that encourages students to be critical and creative.

### **E. Help Students be Flexible**

Help your students learn to be flexible. Chemistry can be difficult for students because it is complicated. Chemical systems are typically influenced by a large number of factors. Because of this, a fail-safe method usually cannot be given even for a particular type of problem. Students must learn not to be locked into a particular method, but to let the problem guide them toward its solutions. To help them learn to do this, you should stress flexibility in solving problems. Students cannot solve chemistry problems by memorization, rather they must understand the underlying concepts. Use a variety of methods in your teaching.

Most students will never have to solve a stoichiometry or resonance problem in the real world, but an understanding of chemical principles may well be important for many of them. So, you must be careful to use problems that test the students' understanding. They must understand that getting right answers is not their only goal. Give some "problems-with-a-twist" in your presentations to prevent students from simply memorizing methods of solving problems.

### **F. Support Course Materials**

You may not be satisfied with the chosen text, lab book, etc., but don't express this

to the students. If you undermine their faith in the learning materials, you will potentially undercut their morale. You are encouraged to be constructively critical, but discuss your concerns with your Lab Director, not the students.

## **VII. Conclusion**

This guide has covered the teaching policies for the Department of Chemistry. It has detailed your responsibilities as well as general concerns and requirements of a Teaching Assistant. It will serve as a reference for you during your time as a Teaching Assistant.

As shown in the personnel chart, TAs have many important interactions with all aspects related to teaching and learning, ranging from students and the faculty to the support staff. You hold a prominent position in the eyes of the students, the faculty, and the Department, since you play an important and central role as part of the teaching effort in the Department of Chemistry.

With the importance of your role stated above, communication is the key to fulfilling your role. Therefore, you should direct any questions or concerns to your Lab Director, since we are here to support you.

It is the Department's hope that you will find teaching to be exciting, enjoyable, and rewarding while a Teaching Assistant in the Department of Chemistry. Furthermore, the skills you learn while in this program will benefit you in your future endeavors.

## **Appendix**

**CHEM XXX Student Evaluation – X Quarter 20XX**

**Student** \_\_\_\_\_ **Section** \_\_\_\_\_ **Eval Score (100 max)** \_\_\_\_\_

Please circle the number which corresponds most closely to your opinion on each of the following statements.  
(1 = **strongly disagree** to 5 = **strongly agree**)

This student:	Disagree			Agree	
1. is neat and tidy in lab.	1	2	3	4	5
2. is on time with assignments and to class.	1	2	3	4	5
3. can work independently.	1	2	3	4	5
4. takes responsibility for mistakes made.	1	2	3	4	5
5. can clearly communicate scientific ideas verbally	1	2	3	4	5
6. shows innovation in problem solving.	1	2	3	4	5
7. is considerate and respectful of others.	1	2	3	4	5
8. can clearly communicate scientific ideas (written)	1	2	3	4	5
9. has positive attitude and shows interest	1	2	3	4	5
10. actively participates in discussions	1	2	3	4	5

Please answer the following and be as descriptive and specific when possible:

- a. What are this student's strengths and give a specific example.
  
  
  
  
  
  
  
  
  
  
- b. What is this student's major weakness and how has the student tried to overcome it? Give an example if possible.
  
  
  
  
  
  
  
  
  
  
- c. Do you think this student will make a successful professional (medical doctor, scientist, etc...)? Why or why not?
  
  
  
  
  
  
  
  
  
  
- d. Did the student have either exceptionally good or exceptionally poor performance in class that would qualify him/her for a bump up or down in grade?

TA NAME \_\_\_\_\_ Signature \_\_\_\_\_

## Chem XXX TA Evaluation - X Quarter 20XX

Please take a few moments to fill out the following evaluation form. You do not have to sign your name. Your TA will be shown the cumulative results of the survey only. Return your completed survey to the envelope provided in lab. Please be sure to include your TA's name and your section number.

Please circle the number that corresponds most closely to your opinion on each of the following statements.

The TA in my section:	Disagree					Agree				
1. is always well prepared for lab.	1	2	3	4	5					
2. gives directions clearly.	1	2	3	4	5					
3. is always in control of the lab section.	1	2	3	4	5					
4. is available to answer questions during lab.	1	2	3	4	5					
5. is generally helpful and offers useful advice.	1	2	3	4	5					
6. is always prepared for discussion section.	1	2	3	4	5					
7. answers questions thoroughly in discussion and/or makes an effort to find the correct answer when unsure.	1	2	3	4	5					
8. enforces safety regulations and policies	1	2	3	4	5					

Do you feel this TA has a severe problem communicating due to a language or accent problem? Yes      No

If your TA were to be available next quarter, would you want this person as your TA? Yes      No

TA: \_\_\_\_\_

Section number: \_\_\_\_\_

What are your TA's strengths?

How could your TA improve his/her teaching abilities (please be specific and constructive)?

## Chem XXX TA Evaluation - X Quarter 20XX

TA:

Section number:

	Satisfactory			Unsatisfactory	
<b>Dependability:</b>					
Completes grading on time	1	2	3	4	5
Is punctual and begins teaching as scheduled	1	2	3	4	5
Attendance at TA meetings	1	2	3	4	5
Makes appropriate arrangements for absences	1	2	3	4	5
Ensures safety in the laboratory	1	2	3	4	5
Ensures laboratory clean up	1	2	3	4	5
Remembers to secure labs and instrument rooms	1	2	3	4	5
<b>Knowledge:</b>					
Recognizes priorities and how teaching relates to other responsibilities in and outside the department	1	2	3	4	5
<b>Quality:</b>					
Shows initiative	1	2	3	4	5
Implements improvements	1	2	3	4	5
Communicates well with others on common goals	1	2	3	4	5
Accepts guidance willingly	1	2	3	4	5
<b>Attitude:</b>					
Toward students	1	2	3	4	5
Toward supervisors	1	2	3	4	5
<b>Overall Rating:</b>	1	2	3	4	5

**Comments:**

- 1: Poor performance on all levels (unsatisfactory)
- 2: Poor performance on some levels, such as student evaluations or irresponsible behavior (unsatisfactory)
- 3: Adequate performance, did just enough to fulfill responsibilities (satisfactory)
- 4: Good performance, did some things exceptionally but adequate with others (satisfactory)
- 5: Exceptional performance, exceeded expectations (satisfactory)

## General/Organic Chemistry TA Discussion Evaluation

TA Name \_\_\_\_\_

The following are areas that you have either mastered or need to improve on in your discussion. These topics come directly from the TA guide, and more information can be found there.

1. How well prepared was the TA? Were topics presented thoroughly?
2. How was the TA's time management? Did topics proceed too quickly or too slowly?
3. Was the TA enthusiastic about the material? Did he/she criticize the course materials?
4. Were the students treated in a respectful manner? Was the TA professional in attitude and appearance?
5. Did the TA speak clearly and loudly? How well did the TA communicate with students? Did the audience have difficulty understanding the TA's diction or accent?
6. How well did the TA use the chalkboard?
7. Did the TA lecture to the students or was the presentation a class discussion with student participation?
8. How well did the TA answer questions? Was the TA open and honest if he/she didn't know the answer? Were directions given clearly?
9. What were other strengths of the class?
10. How can the TA improve his/her discussion?