Handbook for Teaching Assistants

http://www.its.caltech.edu/~cpet

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Quick Contacts

Caltech Project for Effective Teaching (CPET) cpet@caltech.edu
Teaching consultation, tools for feedback, and opportunities for involvement.

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Dean of Students x6351
Assistance for undergraduate students, consultation on academic procedures.

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Repairs and heating/cooling of facilities.

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Handbook for Teaching Assistants

California Institute of Technology

a publication of the Caltech Project for Effective Teaching (CPET):

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Introduction

Overview of TA Responsibilities

If you are a first-time teacher or even just a first-time Caltech TA, you're probably already wondering: exactly what responsibilities and expectations come with your TA position? How is your course organized, and what is your role in that organization?

The only rule of course organization at Caltech is that there *are* no rules. Caltech's remarkably informal, non-bureaucratic structure extends to classes. You may TA as a part of a class like Ch 1, which has a definite TA hierarchy including a head TA, head grader, recitation TA's, and grading TA's, each with clearly defined responsibilities; or you may be the only TA for a seminar course with the sole duty of ordering weekly pizza lunches. The important thing is to clearly understand before the class begins exactly what your responsibilities are—the things you should be doing as well as the things you *shouldn't*.

Meeting with your professor for an hour before the course starts is extremely important; you can avoid a lot of confusion and misunderstanding by setting up course rules at the beginning of the term. Although it is often difficult to get in touch with a professor, particularly on a short time scale, it will benefit you greatly to do everything possible to meet with your professor and learn about the course before you begin teaching it. Your course will run much more smoothly if the professor and all TA's have a shared understanding of course rules and division of responsibilities. (If you're taking the course while you're TA'ing it, this becomes even more important!)

At the end of this section you'll find a table with some likely duties of different TA assignments, but your assignment is sure to be unique in the exact details. Some recommended questions are:

1. Will there be any regular TA-professor meetings?
2. Who will be responsible for writing problem sets and exams? For grading them?
3. Are the TA's expected to help prepare lecture or lecture notes? To make lecture notes available to the class?
4. Are the TA's expected to attend lecture? To take detailed lecture notes?
5. Will the TA's be asked to deliver any lectures? If not, will they be free to teach a lecture if they wish to?
6. Are the TA's expected to hold office hours? How often?
7. In courses with multiple TA's, how will the TA duties be divided?
8. Will there be any review sessions out-of-class? Who will prepare and present them?

9. Who will review requests for extensions on problem sets and exams? Are the TA's allowed to grant extensions? Without notifying the professor?
10. Can the TA's make changes in grades/points if a mistake has been made on problem sets? Exams?
11. Are the TA's expected or allowed to prepare supplementary course materials for their students?
12. Who will talk to students wishing to add or drop the course, and who will sign the add/drop card?
13. In courses with multiple class meeting times, who will review student requests to switch sections?

In addition to these questions about your responsibilities, you should know the following information regarding the course itself (try to get the instructor to write this information into a course syllabus):


Photo by Bob Paz, CIT

- What are the collaboration policies for homework, exams, lab write-ups, etc.?
- What is the grading procedure?
- If exams are to be given, what will the exam format be?
- Are there any materials on reserve that might offer additional help?
- What are the policies on make-up exams and late assignments?
- Will there be a review session for midterms and final exams?

Once the course is underway, it is recommended that you know or do the following:

- Know what the professor wishes to accomplish in the course.
- Know your responsibilities.
- Make sure you have a syllabus and access to the course textbook(s).
- Brush up on any course material not thoroughly familiar to you.

- Stay up to date on what is being covered in class.
- Be prepared to write problem sets and/or exam questions if this is asked of you.
- Find out if there is a head TA you can refer to, or whether you should speak directly with the professor.
- Know what to do if you fear a student has violated the Honor Code. (Refer to the "Honor Code" section of this manual.)

As the term progresses, you will be in the best position to assess whether the students are learning the course material. It is important for you to communicate with the professor if the students are having difficulty with the course. If your TA responsibilities are overwhelming, refer to the section on "Balancing Time Commitments" for help with what to do and who to talk to.

Typical TA Assignments

Usually Required	**Sometimes Required**
General TA (usually for smaller classes) Grade problem sets and/or exams Prepare problem sets and/or solution sets Have regular office hours Attend lectures and interact with students	Hold review sessions Deliver lectures in class Set up classroom for lectures Maintain a website for the class
Recitation TA Prepare and hold recitation sessions Prepare exams, quizzes, homework… Attend lectures and interact with students Prepare review sessions Prepare freshman progress reports	Give demonstrations Write student recommendation letters Substitute teach the lecture portion
Grading TA Grade homework and/or exams Prepare solution sets Determine grading scheme	Attend class lectures Resolve grading disputes
Laboratory TA Maintain equipment Know the techniques used in the lab Supervise labs, interact with students Set up and clean up lab Grade lab reports	Hold office hours Attend class lectures (if any) Design experiments Develop and distribute pre-lab information

Styles of Teaching and Learning

Perhaps for the first time in your life, you are on the other side of the desk! Along with this privilege comes the responsibility to set an example of respect, hard work, and dedication for your students.

Your own experience as an undergraduate should prove helpful in guiding your teaching efforts. What did you hope for from your instructors? What did they do that helped or enabled you to learn, and what did they do that made your life more difficult? Emulating your best instructors and avoiding the mistakes of your worst ones will help you greatly as you begin to teach. However, keep in mind that since both you and your students are distinct individuals, effective teaching and learning must allow for variations in your own personal styles.

Effective learning strategies differ greatly from person to person. Some absorb material by reading and writing it, others by discussing the subject orally. Many learn best through concrete examples, but some do better when they begin with an abstract principle. While almost everyone learns well by doing, there are wide variations in the amount of direction people prefer when approaching a new activity. In addition to these and many other style differences, your students will come to you with unique levels of preparation and degrees of intellectual maturity.

As a TA, you should strive to offer enough variety in your teaching so that all these different students can "catch on" to something. If you adopt a more convenient notation, offer a special handout for those who haven't seen it before. When working sample problems, don't be too quick to take offense at the student who never lifts her pen – or at the student who is so deep in note-taking that he doesn't hear your question! Introduce new lab equipment with a helpful demonstration, but allow the inevitable tinkering in the corner unless safety is an issue. Be aware that many Caltech students skip lectures and learn from their textbooks, though some prefer to work just the opposite way.

For many of your students, Caltech provides the first academic challenge serious enough to make them discover effective learning strategies. Furthermore, the goal of their coursework here is to learn not only the material, but also how scientists think – and that includes you. So certainly don't hesitate to share learning tips or to give advice on study strategies; just don't assume that what works for you is exactly what will work for everyone else.

You as a teacher will also develop your own style that depends on your intellectual approach, your "stage presence," and your personal interactions with students. By imitating strategies of great teachers you have known, you'll learn what does and doesn't work for you. While the exact style you develop will be all your own, there are a few do's and don'ts that can help you shape a classroom persona:

Do…show enthusiasm for the subject matter by being energetic, giving examples you find interesting, and having fun with your teaching assignment. Your enthusiasm for the course helps motivate your students.

...provide a larger context for the material you are teaching. Reminding your students of a broader perspective can be a powerful motivating tool.

…show respect for your students intellectually and personally. For more discussion of this subject, see the section "Diversity in the Classroom."

…engage students in the material by encouraging them to interact with you and with each other. Collaboration is an integral part of most students' learning experience at Caltech.

Don't…be a mean and uncaring instructor. When students come to office hours, don't grumble about the other work you were doing when they interrupted. When students come to you with special circumstances, try to deal with them fairly and within the context of the Honor Code. The American university experience involves more explicit teaching and guidance than is the norm in many countries, so if you were educated outside the U.S. you will need to be aware of this difference and open to adapting to it.

…insult your students, either by telling them how easy the material is or by being condescending. Be very wary whenever the words "clearly," "obviously," or "trivial" creep into your vocabulary. Students find these words offensive and infuriating! Even if you find some students less than respectful, don't retaliate but instead model the behavior you'd like them to learn from you.

…bore your students and yourself. If you're not engaged, chances are nobody else is either. Find a way to shake things up a bit.

…confuse students by teaching at your level instead of theirs. Sometimes it takes a bit of extra work to recall what connections and subtleties your students are and are not prepared to appreciate.

…oversimplify the material until your students feel great but haven't learned enough. While this route is tempting for a new TA who wants happy students, it means you're ultimately shirking your responsibility to help them through the course.

Diversity in the Classroom

Almost all students coming to Caltech have been academically very successful, and it is very important that everyone be given a fair chance to succeed here. Having a TA who is biased against any group of people at Caltech creates an unhealthy environment. The impression that all students should get from you as their TA is that you believe they can and want to learn and do well. You may know and appreciate your students' unique personalities and backgrounds. However, students should be able to feel these traits do not influence how you judge their academic efforts and performance. Part of your role as a TA is to support a learning environment that is encouraging for all students, regardless of gender, ethnic origin, culture, or other personal factors.

Gender and Ethnic Group

Some studies indicate that women and members of several ethnic groups may lose interest and self-confidence because of *stereotyping* behavior by professors, TA's, advisors and peers, who collectively generate a chilly climate for learning. If you believe that a certain "type" of student will fail, that expectation may become self-fulfilling.

Stereotyping of situations and individuals begins at an early age. By the time one reaches the university level, it may be so ingrained in the behaviors of both men and women that, unless it is brought to our attention and we make a conscious effort to stop it, the behavior perpetuates itself unnoticed.

So, *examine your own attitude.* Observe your behavior and that of others around you. Ask yourself whether you or they inadvertently treat students differently on the basis of gender, cultural background, or some other classification.

Avoid behaviors that contribute to a chilly climate:

- Avoid disparaging (and false) generalizations about any given group (for example, about women's intellectual abilities or professional potential). Avoid comments that indirectly, and incorrectly, imply that members of a given group are not as competent as others.
- Avoid off-hand questioning of a female or an ethnic minority student's seriousness of purpose or academic commitment, even (especially) in a joking style.
- When advising women or minority students, be sure you do not unconsciously set less challenging academic goals for them.
- Never use sexist or racial humor as a classroom device. If a student uses such humor in class, you should state politely, but clearly, that it is in poor taste. At minimum, do not "go along with" such humor in order to be friendly or nice. Saying simply "remarks like that are inappropriate" can go a long way toward eliminating gender or racial humor, and send a strong, positive message to the other students.

- Obviously, never refer to a woman's (or man's) physical attributes in a classroom or laboratory situation.

Create a welcoming learning environment for all your students. Encourage interaction and respectful discussion. Put people of different genders and backgrounds in the examples you use to explain principles. This not only helps everyone better relate to your examples, but, with a little creativity, it can make them more interesting.

Cultural Issues

The international culture of science and technology is well represented at Caltech. Caltech students come from more than 58 different countries and all parts of the U.S., forming a wide cross-section of linguistic, religious, and ethnic backgrounds.

At Caltech, you will be teaching and working with students from cultures and backgrounds other than your own. Although the professional expectations of scientists and engineers are similar around the world, individual values, communication styles, and language skills can create barriers to learning and understanding. Even when people seem to be the same on the surface, their deeply rooted individual understandings of power balances, interpersonal communication patterns, and learning expectations can vary a great deal.

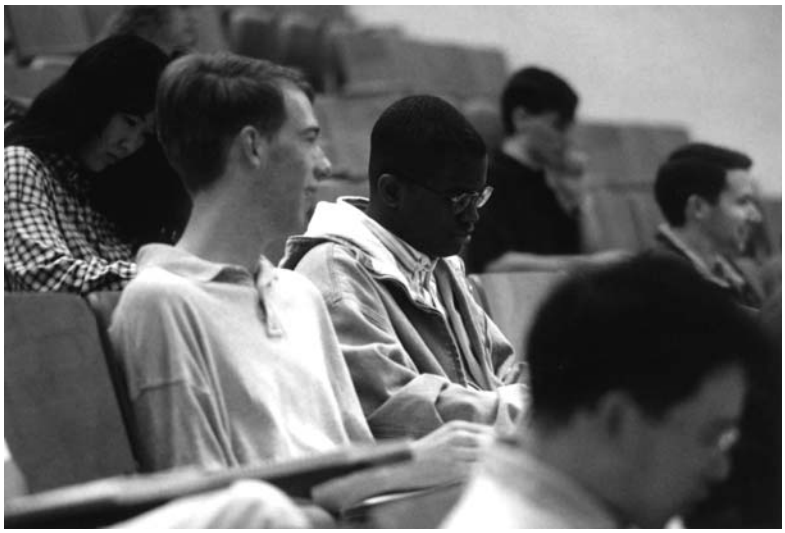


Photo by Bob Paz, CIT

To minimize the problems that can arise from cultural differences in the classroom, we encourage you to:

- Inform students of class norms and coursework expectations clearly at the outset of the class.
- Prepare handouts and use the board to write down key points, new terminology, and an outline of the class lesson. Refer to the board and handouts as you progress through your lesson. This is particularly helpful in overcoming language barriers.
- Hold regular review times at the beginning or end of each class or section as a way of helping students feel comfortable asking questions and encouraging them to interact with you about the general subject matter.

- Be attentive to the possibility that cultural factors or language difficulties are operating if you feel confused or uncertain about an interaction you are having with a student in your class.

Whether you are an international student yourself, or an American TA interacting with international students, some general differences between American culture and most others may be helpful to keep in mind. Of course, the following comments are generalizations and will not hold true for every American or for every foreign culture!

- Americans value independent and critical thinking. It is not only acceptable but encouraged for students to approach a problem from a different angle from that suggested by their teacher. American students expect the freedom to question the authority and expertise of their teachers. In contrast, in many countries it is disrespectful to ask questions in class or to challenge an instructor directly. Typical American student behavior may appear offensive to an international TA, while international students who are being "respectful" may seem shy or dull to an American TA.
- Americans generally reject the formality of student-teacher relationships that is the norm in most other cultures. Although many Caltech faculty, particularly those of an older generation, expect a somewhat formal relationship with students, casual interactions are the general norm. Student classroom behavior is often much more relaxed than in other cultures. It is common for students to come to class without shoes, eat or drink during class, or talk with a neighbor. They may arrive late or leave early. They may call instructors by their first names and speak in a tone that does not convey respect. If you are an international TA, do not interpret this behavior as a lack of respect for you. If you are an American TA, you may be uncomfortable with the level of respect and authority accorded to you by your international students; don't feel you must respond by pretending to be all-knowing or stand-offish.
- U.S. graduate students play a far more active role in the education of undergraduates than do their counterparts elsewhere. International students may not seek help as readily as their American counterparts, and may need to be encouraged to visit office hours or talk with you after section. International TA's may find that American students expect a lot of help and direction; remember what they ask may be typical and reasonable in a U.S. university.
- If you are concerned about language barriers, create a friendly atmosphere by introducing yourself and trying to know your students by name. If your native language is not English, discuss this with your students and urge them to ask you right away if they hear a word that they do not understand. If you are an American

TA with non-native speakers in your class, talking to your students one-on-one may help you discover the extent of the language barriers and work around them.

- If you are uncertain how to deal with a difficult language or cultural problem, contact International Student Programs (x6330). Talk with other teaching assistants about how to handle difficult problems and learn from them by observing what they do in their sections or classrooms. The Writing Center and ESL program can also help you with language concerns.

Students with Disabilities

As a TA you may also encounter Caltech students with specific, diagnosed disabilities. Some of these students need slightly modified settings in which to do their best work. If a student discusses a disability with you, it is your role as a TA to be open and supportive and to work with other campus offices to make sure appropriate arrangements are made. The Caltech policy, quoted below, gives basic information and contacts should you come across this issue in your teaching:

> It is the policy and practice of Caltech to comply fully with the Americans with Disabilities Act, and other applicable federal, state and local laws to ensure equal opportunity for qualified persons with disabilities. Caltech is committed to ensuring that there is no unlawful discrimination in any of its programs, services, activities, and terms and conditions of employment. As required by law, Caltech will provide reasonable accommodations to qualified individuals with a disability.
>
> It is the responsibility of the Caltech administration and faculty to ensure the Institute's compliance with this policy.
>
> The following individuals have been designated as contacts regarding disability issues:
> Graduate Students:
> Dr. Sharyn Slavin Miller, ext. 6321
> Assistant Vice President for Student Affairs
>
> Undergraduate Students:
> Dr. Barbara Green, ext. 6351
> Associate Dean of Students
>
> Students may receive free assessment for Attention Deficit Disorder or other learning disabilities if referred by the Student Counseling Center. Students should contact the Counseling Center for an appointment at ext. 8331.

General Teaching Tips

In the next portion of the handbook you will find guidelines and advice for a number of specific teaching activities that you may encounter as a TA at Caltech. Before focusing on specific tasks, however, we end this introductory section with a few teaching tips that should apply to a broad range of situations. To best prepare for your role as a TA, we suggest that you begin with these general tips, browse the individual sections that follow, and talk to people in your department/division for even more useful specifics.

In general...

Honesty is absolutely essential. Let your students know that you are not infallible, and do not forget it yourself. Don't feel you have to be prepared with every answer in order to earn your students' respect. Sometimes a wonderful answer is, "I don't know, but I'll try to find out and get back to you."

Flexibility will make you a far more effective instructor:

a) Be flexible in your explanations. If the beautiful analogy you spent hours dreaming up just isn't working, try a different approach. Watch your students' responses. Some people learn best by reading, some by listening, and some learn best from examples. Try to provide your students with a combination of these forms of information so they can choose to use whatever is best for them. Talk to other TA's for ideas to help vary your teaching style.
b) Be flexible about your office hours and the ways you interact with students.
c) Try to open as many channels of communication as possible. E-mail is popular with most Caltech students. Ask your students if they would like to get updates, information, and clarifications via e-mail, and have a sheet ready to hand around to get the addresses of those who do.
d) Encourage your students to call, e-mail, or write you with questions, if you are comfortable with them doing so. Remember that what one student asks, ten more are silently wondering about.

Motivate your students. You should strive to provide a learning atmosphere that keeps your students motivated. Striking a reasonable balance between motivation and information content is essential to your success as a teacher. What specific things can you do to encourage student motivation?

1) Help students succeed rather than fail. The questions you ask and the standards you set when grading should not be too lenient, but if they are too challenging, students will not be able to live up to them.
2) Keep your educational pace rational and reasonable. Build upon what the students

already know. This is often somewhat beyond your control, as you will rarely be in charge of the course syllabus and pace. But whatever pace the professor may choose, don't "firehose" your students with information.

3) Give immediate and comprehensive feedback. Be encouraging. Reward success openly and immediately, and allow students to feel comfortable expressing uncertainty. When a mistake is made, students need to receive specific feedback delineating why an answer is wrong, but even wrong answers can be corrected without undermining a student's dignity. Try to use a point of confusion as a stepping stone to a clearer explanation.

4) Appeal to your students' interests. Direct your motivational efforts toward promoting student interest in your subject, rather than placing undue emphasis on their performance. Be enthusiastic about your subject. Remember, the most successful teachers inspire their students by example; motivation *is* contagious! You don't have to be a ball of lightning all the time, but hopefully it is some measure of enthusiasm for your subject that has brought you to grad school — share it with your students.

Communicate with the other teaching staff for your course -- the professor as well as other TA's and graders. Exchanging information regularly helps all of you to gauge students' understanding and adjust the course appropriately.

Get to know your students. Address them by name and encourage them to do the same with you. Participate in undergraduate life. You can probably get an invitation to dinner at an undergrad house if you are interested. Most of the undergrad parties are also open to graduate students. Your interactions with students should be overwhelmingly positive. However, be prepared for the chance that you may be misunderstood or stereotyped. You might be the target of certain remarks or jokes. When you are uncomfortable in such a situation, *direct and honest communication* is in general the best option. If the behavior persists, you may want to talk to someone (see the "Harassment Policy" section of this Handbook).

Specific Teaching Activities

Getting Started: Your First Meeting with Students

For new and experienced TA's, the first session with a new group of students is a challenge that can cause more than a little anxiety. The first meeting of a lecture, recitation section, or lab gives students and teacher the first opportunity to learn about each other and find out what they can expect of their working relationship throughout the term. Standing up and filling the silence before a group of expectant strangers can be daunting, but a few simple strategies can help you navigate "first contact."

Before the session, prepare yourself by learning what you can about how the course works. Talk with the instructor, TA's from previous years, and people you know who have taken the class. Find out about the students you can expect: who takes the class, why, and with what level of preparation? Be aware of any extraordinary reputation the course has gained in recent years. Finally, make sure you understand how the course will be run this year. If the instructor has not created a course information sheet, you and other TA's may want to write one up yourselves. Such a sheet might include items like the names and contact information for the instructor and TA's, the course meeting time and place, information on sections, homework and exam schedules, collaboration and grading policies, syllabus, and required and recommended texts for the course. Of course, if you make your own info sheet, run it by the professor for approval before distributing it to students.

Plan out a program for your first meeting with students. If you're not sure how much material you can cover, plan too much rather than too little, but prioritize and identify good stopping points throughout the lesson. Overpreparation can be a big help if you are nervous in front of your new students! When you've planned your session, think ahead and visit the meeting room to make sure you'll have all the materials you need, from simple chalk, markers, and erasers to working lab equipment, overheads, textbooks, and other supplies.

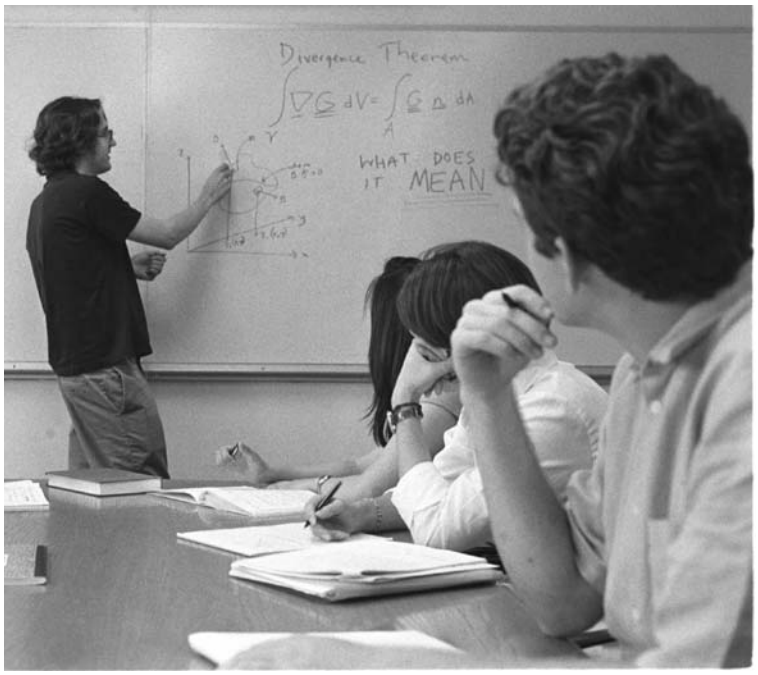


Photo by David Flanagan, CIT

The best way to begin a first meeting is often with straightforward introductions. Give students your name and contact information, including any times and places you don't want to be contacted! Adding a little more information about yourself – for example, your research topic at Caltech, your undergraduate school, or where you are from – helps encourage students to interact with you. You can also ask students to introduce themselves, including a few pieces of information you would find helpful or entertaining. These introductions can be verbal in a small group, or you can ask students to write them on index cards for you to keep.

Course administration and organization is likely to be on everyone's mind at the first session. Clarify or highlight things the instructor has already gone over, and supply information that is still missing. If the course is a lab, scheduling and safety issues may need to be addressed. Now is also the time to present your own perspective on what you will be doing together this term; this might mean discussing your favorite part of the course material, explaining why you think the subject is important, or sharing your own private strategy for mastering the concepts you'll be studying.

After dealing with course mechanics, move on if possible to some actual course material. For example, you might plan a review of topics from the first lecture, a preview of things to watch for next week, or a short lesson on the use of some ubiquitous piece of lab equipment. Give students an outline of what you have planned to cover and where you are going with the lesson. If you are comfortable improvising, you may offer to treat a different "burning question" instead if they prefer.

Try to close a minute or two early to sum up the session, remind students of the next meeting, and take final questions. Remember to pause for questions and discussion throughout the session; don't be thrown by unexpected questions, but remember that, "I don't know, but I'll try to find out" is a perfectly acceptable answer in most situations.

Recitation Sections

The purpose of recitation sections is to offer students a more interactive environment than can generally be found in lecture. In recitation sections you can focus on the specific concepts students are having the most difficulty with, and discuss how the course material applies to the homework problems. We offer the following specific suggestions to help you succeed as a recitation instructor:

A. Preparation

Preparing yourself for recitation is *absolutely essential.*

1. Ask yourself what the purpose of your recitation section is, and how it relates to the larger course goals. The purpose may change as the school year proceeds. You can safely assume that your students will want to know about the main points they were supposed to learn in lecture, and they would love to get some specific advice on upcoming homework, quizzes, and exams. It is often useful to give a "big picture" view of topics covered in class during the week.
2. Try to get feedback from students about what problems they are having and what they would like to learn from you. Then follow up by implementing their suggestions.
3. You need to do many of the same things your students are supposed to do, preferably *well in advance* of the time they start doing them. If there is reading assigned, you might be asked about it, so it is wise to give it, at minimum, a cursory read.
4. You should attend the course lectures so you know what topics have been covered and what approach the professor took in explaining the material. This can also help you get a feeling for what the students do and do not understand.
5. Know where your recitation classroom is, make sure it has the mechanical things you will need (like chairs and chalk, for example), and have any props, handouts, or demonstrations ready to go well before class time.
6. Make an outline of important things you will want to discuss, prepare concrete examples you can present, and try to anticipate what questions are likely to be asked of you and how you will try to answer them.
7. Arrive early, even if most of your students tend to arrive late. Arriving early also allows you to talk informally with some of your students and get to know them a bit better.

Remember, recitation sections are almost always optional. If students think their time is better spent in bed or in the library, that's where they will be. *It is very hard to draw*

them back once you lose them.

B. In the Classroom

Giving a good lecture is truly an art, and one that varies dramatically from person to person. Here are some general tips on how you can improve your classroom presentation style.

Verbal Communication:

1. Speak clearly and loudly using words and examples your students can understand. Speak slowly, even if you are nervous. Don't be afraid to stop and think. In fact, while students are absorbing the material, reassess your presentation. *Were you clear?* If not, try to explain the concept in a different way.
2. When a student asks you a question, make sure you understand what they would really like to know. Repeat the question before you try to answer it, possibly rephrasing it and asking the student if your restatement is accurate.
3. Try to refer to your students by name. *It really does make a difference.*

Written Communication:

4. Start with a clean board, print using large letters (this may take some practice), use symbols consistent with the lecture and text, and organize your written presentation.
5. Don't stand in front of what you write. Move around so that all the students can read the board. Make sure that you give your students plenty of time to write down what you put on the board.
6. Avoid obscure abbreviations and unreadable diagrams at the board. Never erase part of something and "re-use" another part; this can make taking notes a nightmare.
7. Handouts can be extremely helpful, and students really appreciate them. They help students listen to what you say. Students are also much more likely to participate in discussions if they aren't struggling to catch up writing notes.

Classroom Environment:

8. Make it obvious when you are starting class. "Any questions before we begin?" is a good line to use. Wait until you have everyone's attention before you proceed. Start by reviewing familiar material and work your way up to the new and more difficult stuff, so that students have a chance for their brains to "warm up."
9. Try to actively involve the class in discussion, and give them some time to practice new concepts. Most people learn best by doing and thinking for

themselves – try to provide time and space for this. Varying the classroom routine to include small group problem-solving or round-table debate can keep students engaged and greatly enrich both your experience and theirs.

10. Keep your class informed. Start class with an agenda of what you hope to cover, and end by reviewing what was discussed and asking for final questions.
11. Don't make your battle to keep the students awake any more difficult than it has to be. A warm room with poor lighting begs people to fall asleep. If there is anything wrong with the room, call the service center (x 4717) and let them know.
12. You, not your students, should control the classroom environment. However, you don't have to make your judgements in a vacuum. You may ask how students would like to see the class time used, make up a questionnaire to solicit their (anonymous) feedback, ask them to let you know if you use unfamiliar units or notation, or have them inform you if you speak too softly or too fast. A sample feedback form can be found in Appendix A of this manual; you can photocopy it, or use it as a starting point for creating your own form. Student feedback may include suggestions you can pass on to the professor or the department.

Try to make your classroom a comfortable and fun learning environment, both for you and for your students.

Grading

Grading is perhaps the most thankless portion of any educational workload, yet it is absolutely crucial. Several warnings and suggestions follow:

1. Make sure that you understand the course's policies at the *beginning* of the course – this will save you much time and pain over the long run. Some important things to cover are:
    a. Who sets the grading policies? These include subjects like how many points each problem is worth, how much should be taken off for mistakes, what penalties apply to late work, and (more and more often) what computer programs students can use on their homework sets. If these things are left to your discretion, it is a good idea to talk to the other TA's and set a course policy, which you can then explain to the students.
    b. What is the course policy regarding work done after a test's official time limit? Many tests at Caltech are given as timed, take-home assessments, so it is not uncommon to find a notation indicating at what point a student ran out of time, followed by answers to the last few questions.
2. You should work out the problem(s) or perform the lab(s) you are grading *before* you even look at the key and certainly before you begin throwing red ink around. You should at least go through the key carefully and decide how you will take points off for mistakes on each problem. Try to provide correction in terms with which the students are familiar and that were discussed in lectures or pre-lab meetings.
3. Consistency in grading is always important, but it is probably most difficult to achieve in a large course. If the grading is divided among many graduate students, you should meet with each other and design a grading scheme that everyone can follow. If you are grading a large number of problem sets, it is critical that you keep track of how many points you are taking off for common errors. Differences of two or three points for the same mistake can be particularly galling. Your students will confer about their problem sets and their grading! Grading by a scheme and keeping track of it will also help you grade late submissions quickly and fairly.
4. Let students know what they did wrong and how much it hurt their score. Circle the point where their logic failed and clearly indicate how many points were deducted as a result. Ideally, write legible comments nearby explaining their error. Provide encouraging comments when students find a good alternative

approach to a problem.

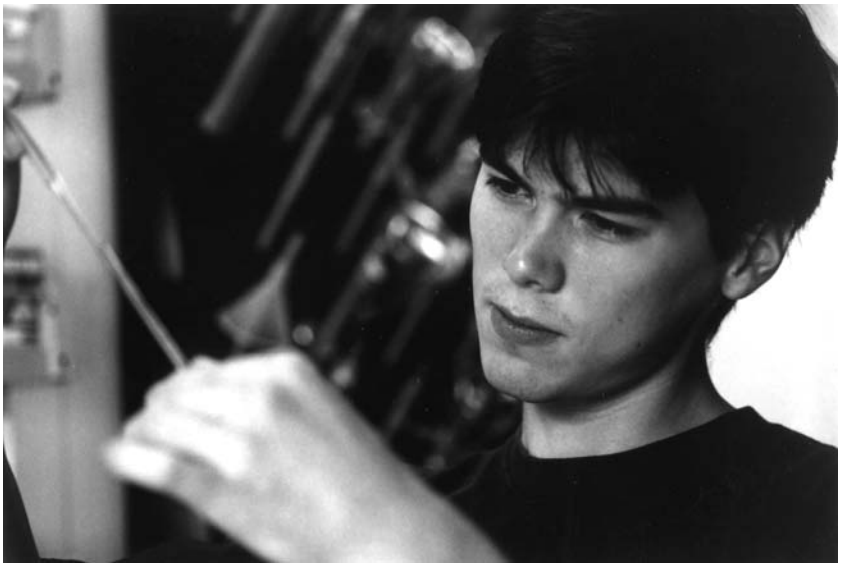
5. Many of your students will spend far more time looking over their graded homework or lab reports than you will be able to spend grading them. Don't be surprised when an angry student comes to you saying, "I want my two points!" Be ready to deal with such complaints fairly and competently. Doling out points automatically and refusing to consider any grading changes are both inappropriate ways to deal with the situation.
    a. Take a look at the student's work and see whether it was graded incorrectly.
    b. If the student is incorrect but does not understand the concepts presented, explain to them what they have done wrong.
    c. If you have made a grading mistake, correct it and record the change; it is very important to students to feel that you are a fair grader. If you have made the same mistake on many papers, you should follow up by issuing a "recall" of the problem sets to the class, or offering to change the grades of students who come in. At the very least, inform students of the error so they are not learning something incorrectly.
6. Talk to the course professor and/or section TA if you notice common errors or important misconceptions in the student work you are grading. This communication is invaluable, especially if you have a purely grading assignment and do not otherwise interact with the students.
7. Know what to do if you fear an Honor Code violation has occurred. Read the section on the Honor Code in this manual, and follow its advice. Consult with the course professor first about a violation, unless you have a previous understanding that you should act on your own.

Labs

Here are a few useful tips to ensure that a lab session runs smoothly.

1. **Preparation:** You should know exactly what the students are supposed to learn and why they have to learn these things. This includes being thoroughly familiar with the details of the experiments and knowing why they are done in a particular way, as well as what the students should get out of them. This usually means knowing how the experiments tie in with the lecture material, if yours is not a freestanding lab class. It is also highly recommended that you perform the experiments once yourself before teaching the students. Even if you've done something similar before, familiarize yourself with the instrument or setup in the lab in which you'll be teaching. Otherwise, you can waste a lot of valuable time (and perhaps be embarrassed) when something goes wrong.

Photo by Bob Paz, CIT



2. **Know all the lab rules** before the first lab begins, and enforce them from day one. Laboratory rules *must be strictly enforced because they are for the safety of the entire class* (even if your immediate supervisor does not make much of them). Your own adherence to rules and firm discipline when safety is at issue are critical in order to avoid serious problems.

3. **First Aid:** In labs where there is a potential for student injury, you should know the location of the first aid kit, basic first aid rules, and procedures for getting emergency assistance.

4. **Your group of students is your responsibility.** It is generally required that you be present in the laboratory from the start of class until the last student is gone. If you

absolutely *must* leave the lab during class, or if you are absent on a given day, find out from your Lab Supervisor how to request an appropriate, qualified person to supervise your students during your absence. If your course involves individual lab groups working at different times, set up a procedure for arranging times that are compatible with your work and personal life as well as with undergraduate schedules.

5. **Make your students think**. Do not take on the responsibility of solving problems for the students, except where they are not intended to be a part of their learning experience (i.e., equipment failures). Help students work through problems on their own.

6. **Are your students adequately prepared?** Make sure that the students understand the essential operating principles underlying the equipment they are using. Generally the lab experiments are designed to take most of the time of the lab period, so it is essential that students read through the experiments *before they arrive*. One way to ensure that they prepare is to assign them a few simple questions from the reading—and then check that they've made an effort to answer them. To save your own time, you can go over the answers at the board while each student checks his or her neighbor's work. This is an easy way to do a short "prelab lecture."

7. **Laboratory reports:** Not all students know how to write good lab reports or lab notebooks; it is important for the TA to help them and let them know what is expected.

8. **Ask questions of your professor or lab supervisor**. In classroom teaching, saying "I don't know, but I'll find out," is perfectly acceptable in most situations. However, when safety is concerned, as it often is in lab teaching, this sometimes isn't good enough. If you don't know, ask someone who does.

(Our thanks to Dr. Jane Raymond, Laboratory Supervisor in Chemistry, for sharing her excellent materials for this section of the TA Handbook.)

Office Hours

Many TA assignments will require you to hold office hours, during which you effectively act as an individual or small group tutor. Services you might be asked to provide during office hours include:

1) Clarification of concepts presented in lecture.
2) Guidance regarding the homework assigned for the course.
3) Review or summary relating to an imminent exam.
4) Academic, career, and sometimes personal counseling.

Simply holding office hours is no guarantee that anyone will show up. How do you get students to come in when they need help?

- Schedule office hours and tutorial sessions at times convenient for your students! ("Convenient" times at Caltech are *never* early in the morning.) If you are a TA for a small class, you will probably be able to arrange office hours to fit into your schedule and students' schedules.
- The default location for office hours is, naturally, your office. (If for some reason you do not have an office, your option and/or the option you are TA'ing for *really* ought to provide you with an office if you are expected to hold office hours!) For a more convenient and informal atmosphere, however, you can try holding office hours at a different location, like the Red Door Café or the Coffeehouse.
- Many students will still not show up to office hours, even if they are at a convenient time, unless you remind them and encourage them to show up.
    - Write a note on their problem set-- "Let's discuss this problem during office hours" or even "Please see me about this." Students are more likely to respond to a message directed at them personally.
    - Keep a turn-in and pick-up box or folder near your office door. When students come by to pick up or turn in their papers, say hello and ask if they had any problems. If the students know *where* you are and *who* you are (and that you aren't a monster), they will be more likely to come by for help. Again, this won't work for everyone (you'll see students trying to sneak past your door to avoid contact), but many will appreciate the attention.
    - Advertise your office hours with a weekly e-mail reminder to the students. You can include general clarifications or corrections to the problem set.
- Make the students feel comfortable during office hours. Listen to the students and give them your undivided attention (don't check e-mail or answer the phone while they are in your office). Don't put them down or be critical ("This question is so

easy", "You are wrong," "You're wasting my time," are things you should NOT say). Periodically ask them for feedback about what you can do to make office hours better.

- Pay attention to everyone in your office hours, not just the person who asks the most questions. Many times, a group of students will come in together and only one or two students will end up actually understanding the problem. The others may just "tag along" and write down enough to solve the problem without understanding it. This can be difficult to do when a group of collaborating students comes in at the same time, but make an effort to interact with each student.
- If you or your students have trouble speaking or understanding English, writing phrases, diagrams, or equations on a white board or on a piece of paper can aid communication.

Photo by David Flanagan, CIT

Office-hour tutoring differs appreciably from classroom teaching, and in many ways it is more challenging. The following suggestions may help you improve your tutoring skills:

1. Preparation is essential. Usually this means working out the assigned homework for the course on your own, going to class, and getting clarification on things you yourself do not understand. Never use a problem set key as a crutch. You should understand the material cold. If you don't, brush up on it until you do. Don't wait until a student asks you about it to discover you can't solve the homework or understand the lecture! By working out the homework in advance, you can help ensure the questions are clearly worded and soluble, and that you see in them the same things the professor hopes the students will discover.

2. Your objective as a tutor should be to give your students the skills or understanding needed to solve future problems on their own. The greatest pitfall in tutoring is to answer a student's immediate question without clarifying the root source of the confusion. Here are some ways to help a student understand a problem:
    a. Ask the student to tell you how they think they should solve the problem. This may include going over the work they have already done. This will help you to figure out how much the student already knows. It may be that the student simply made a math error, and otherwise understands the important concepts needed to solve the problem. Or, the student may have no idea of what they should be thinking about. Most will be somewhere in between.
    b. Once *you* have figured out what problem the student is having, try to help *them* figure out where they went wrong. This is the core skill of being a good tutor. Simply telling them the answer will not help. Neither will sending them away to have them figure it out on their own. Try asking open-ended questions to guide them through the process. For example:
        i. What do you need to know to solve this problem?
        ii. Can you break the problem down into a number of steps? Which of those steps do you know how to do? Which ones are you unsure of?
        iii. How did you get from this step to the next step?
        iv. I don't understand what you did in this part of the problem. Can you explain it to me?
        v. Can you draw a diagram/write down an equation that describes this part of the problem?
    c. If a student thinks they know the answer to a problem, and wants to know if they are right:
        i. Is your answer what you would expect to get for this problem? Does it make sense?
        ii. Can you show this is about the right answer from a graph or from an order-of-magnitude calculation?

It is reasonable to have the student show you their answer and for you to then say they are correct. It is, in general, not good to tell the student the answer to a problem, even if it is necessary for them to show their work. Courses have different policies regarding problem sets and the Honor Code, so check with the professor if in doubt.

3. Don't stick doggedly to one line of explanation. The explanation or method presented in class or in the textbook is not likely to be the only way to explain something. Keep an open mind -- the student may find a way of solving a problem that you didn't think of. Presenting alternative explanations or analogies will help the students remember and understand a concept better. If you use analogies, remember that every analogy breaks down at some point! Be sure to explain the limits of the analogy to the students.

If a student asks for personal or career counseling, remember that you may not be the most qualified person for the student to be talking to. If you don't feel confident you can provide the help or advice a student needs, refer them to the Resident Associate (RA) in their house, to the Dean of Students' or Graduate Dean's Office, or to the Ombuds Office (see "On-Campus Resources for Students" in this Handbook).

References:
http://www.grad-college.iastate.edu/speakteach/TAsectionIV.html#Advising
http://www.msu.edu/unit/taprog/ch1.htm

Mentoring Undergraduate Research

An undergraduate may approach you about the possibility of doing research under your direction, or your advisor may ask you to supervise a student he or she has been speaking to separately. Unlike the TA obligations that help support your salary, mentoring a SURF (Summer Undergraduate Research Fellowship) student or other undergraduate doing research should be a voluntary choice on your part. Before you commit to doing so, it is wise to ask some questions to determine if you, your advisor, and the undergraduate have compatible expectations.

Caltech has several common types of undergraduate research appointment. Be aware of the various categories, described in the section "Undergraduate Research Programs;" individual programs may require different time frames, research goals, and written reports for the student you are mentoring. Of course, consult with your research advisor before offering a SURF or any other research position.

Do not get involved in an undergraduate research project for the possible benefit to yourself. From the outset, and throughout the research effort, your goal should be to provide a positive, realistic, and educational experience for the undergraduate(s) involved. Ulterior motives are unlikely to pay off and may constitute a violation of the Honor Code.

There are two general types of research projects open to undergraduates. They can either get involved in a portion of a graduate student's main research project, or they can work on a project of their own. Each approach has advantages.

Most thesis projects have periods when an extra pair of hands would really help move them along . . . and undergrads, especially less experienced ones, can benefit from having an initial research experience involving more direct participation on your part. On the other hand, this means involving another person in research that you want done on a defined (and probably short) time scale. It materially affects you if the student does not accomplish what they set out to do.

Giving a student a project of their own, perhaps an offshoot of your research or something you have thought of but decided not to pursue full time, gives them something they can make their own—and you are not waiting for their results in order to continue with your own work. But all research projects take time and effort to carry out, and will almost certainly lead to unanticipated problems. How much time it takes to sort out such problems depends on your interest level, your communications skills, and the ability and independence level of the student.

Before you take on an undergrad research student:

Some questions to ask the student:

- Is this for pay, or for credit, or both?
- How long do you intend to spend on the project (hours per week, but also number of weeks/months)?
- Why do you want to do a research project? Why in this lab?
- What kind of research experience do you already have?
- If the student wishes to do research work during the academic year, can they balance the time requirements of academics and research? (If you don't know already, you will most likely get a taste of how hard this can be during your first few years at Caltech.)

Some questions to ask yourself:

- Do you have the time and inclination to interact with an undergraduate? What is your schedule and how flexible is it?
- Can you offer this student a viable research project that interests them and is within their reach? Is your advisor willing to provide the necessary financial support for this undergrad? Are the student's expectations of the project and of themselves reasonable? Be warned that undergrads tend to be overly optimistic.
- Can you get along with the student? It is unfortunate, but two perfectly nice people can be incompatible coworkers, especially in a stressful research situation.

Once you are working with a research student:

- Bear in mind that there is a lot to learn in any research project, both in terms of specific techniques and research approach. Be sure to provide instruction in both aspects—how to do something and why it is done.
- Layer the information. Start your background explanations with the big picture. Do not try to teach your research student everything you have learned over the past four years during the first demonstration.
- A tried-and-true rule of thumb is: watch one, do one, teach one. When your student gets their first chance to “do one”, they may need you to lend a hand, but avoid taking over. Once the student is reasonably comfortable with the technique, then give them pointers on how to perfect their style.

Writing Letters of Recommendation

From time to time a student you have TA'ed may ask you to write a letter of recommendation. For many of us, this is a first experience with *writing* a recommendation letter. Here are some guidelines to keep in mind while considering the request and writing the letter. You can also seek letter-writing advice from the Career Development Center.

Should you write the letter? It is flattering to be asked for a recommendation, but you can best look out for the student's interests and your own by thinking before you accept. Depending on the purpose, would a letter from a professor really be more appropriate? You can encourage the student to approach the professor directly. If you like, you can even offer to work with the professor to draft a letter that includes your detailed knowledge of the student but also comes with the professor's perspective and name recognition.

If you are approached by a student whom you truly cannot recommend, honesty is the best policy. It is hard to refuse a request, but your student will be better served by a favorable letter from someone else who can truthfully write one.

Before you write, get a little background from the student. What is the purpose of the letter? How should it be addressed and sent? What is the deadline? Will it be confidential? Letters directed outside Caltech should be written on department letterhead if possible.

You may also ask the student to tell you briefly about what they are applying for, and why; this information can help you write a pertinent letter. If you want to be especially helpful, ask the student if there are any concerns you can help address in your letter. For example, if the student's GPA for one term was particularly low your letter could explain how he or she made it through the term while organizing a new community service program and flying home on weekends to visit a sick parent.

Length: A letter should be kept between one and three pages long. An ideal length of two pages shows your interest in and knowledge of the student without boring the reader with too much detail.

Introduction: Your letter should begin by clearly introducing the student and your relationship to him or her – how long you have known the student and in what capacity.

Examples: A few well-chosen examples are crucial in a letter of recommendation. Specific examples show you know the student well, and paint a vivid picture the reader can remember.

Intellectual Ability and Drive: Generally this will be what you know best about the student. Describe your student's intellectual ability and motivation in detail and in relation to other students in your experience. How does the student respond to challenges? Is he or she capable of original thinking? How effectively does he or she communicate ideas, both orally and in writing?

Personal Traits and Activities: Discussion of personal characteristics will depend on the purpose of the letter and on your knowledge of the student. Does the student show leadership? How does he or she work in a group setting? What is the student's response to criticism? Is he or she organized, considerate, ambitious, creative, energetic, adaptable? For a good letter you should select just a few traits that are relevant and that you can illustrate with concrete examples.

Evaluating and Improving your Teaching

Getting Feedback

One of the most rewarding aspects of teaching is hearing pleased students comment on their great TA. Conversely, however, one of the most frustrating aspects of teaching is ignorance of how your efforts are being received. Without feedback, it's very difficult to tell whether your teaching methods have been successful, whether you are teaching at too high or too low a level, and what you might want to consider doing differently.

There are several good ways to obtain feedback from your students. Some TA's distribute index cards to their class before their recitation section. The TA can end class a few minutes early and ask his or her students to write down any concepts that are still unclear. By collecting these and going through them regularly, you can get an idea of what teaching techniques are most effective, and your efforts can be focused on clarifying problems that your students have. Some large courses have undergraduate "ombudspersons" who represent student opinion about how the course is going. You can also ask your students directly for feedback; often, this is more effective one-on-one, or in office hours, than in a recitation section. Another option is to ask the professor or an experienced TA to observe your teaching and give you their comments and suggestions.

There is a TA evaluation form at http://www.its.caltech.edu/~ta/resources.html, providing both html source code for online surveys and a pdf form for face-to-face distribution. A copy of the same form can be found in Appendix A of this Handbook. This form was designed to get feedback at the end of the course, and can provide great data for your teaching portfolio! You can also use the form or some other feedback tool around midterm, if you want tips for improving before the term is over.

If some of the feedback you receive is negative, remember that teaching is a skill like any other. You can improve your teaching ability, and at times you may need to adjust your teaching style to fit your particular situation. If you are not sure what you are doing wrong, or would like some general teaching tips for your TA position, contact the Caltech Project for Effective Teaching (CPET). Work to be the best TA you can, but remember – you won't please all of the people all of the time!

Balancing Time Commitments for Teaching and Research (and Classes!)

It is perfectly normal to feel overwhelmed with responsibilities during a term when you are expected to TA and make progress on your thesis research. In addition to TA'ing and working on research, many first and second (and third…) year graduate students also have the additional burden of taking classes themselves. This section addresses the problem of not having enough time to do everything you need to do. The short version of the advice given here is: prioritize, be organized, and know your limits.

First, it's a good idea to know how much of a time commitment is expected from you for each activity (from yourself and others), and what goals you are expected to accomplish (from yourself and others). Find answers for these questions:

1) How many hours am I expected to TA per week?

Not all TA assignments are allotted the same number of GTA (graduate teaching assistant) hours per week. Your division or option graduate student secretary should keep records of GTA hours assigned to each class and each student. You may also be able to figure out GTA hours from your paycheck. Your GTA hours can give a rough idea of how much time is expected, and whether your TA assignment should take more or less time than the assignments of other people you know.

Photo by David Flanagan, CIT

2) What duties are included in my TA hours?

All activities directly related to your job as a TA are included in your TA hours. This includes, but is not limited to, attending course lectures, attending labs, grading homework and exams, writing tests and problem sets, holding office hours or recitations, giving lectures, preparing lectures, and organizing supplies for field trips or labs. See the "TA Responsibilities" section for more information.

A good way to figure out what is expected of you is to find out what was expected from the TA in previous years, since most classes aren't being taught for the first time. Is the amount of work expected from you in line with the official time allotment?

3) How many hours am I expected to do research?

To be a full-time student at Caltech, you need to register for at least 36 units each term. These units can be for classes you are taking, and/or for research credit. Also, part or most of your stipend likely comes from RA (research assistant) hours. In general, however, most advisors pay little or no attention to these numbers. If it's not obvious how much time commitment is expected from you, it's best to ask in advance.

4) What do others (i.e., your advisor) expect you to accomplish in those hours of research? What about classes?

Does your advisor understand that you have other time commitments? Do they expect you to do as little as possible in your role as a TA? Spend less time on classes and get "OK" grades instead of outstanding ones? Or do they understand that you may not get as much research done this term?

5) How do you benefit from being a TA? What do you want to accomplish this term?

Besides the obvious reward of helping someone to learn, there are definite benefits to being a TA. In other words, it is not necessarily in your best interest to spend as little time as possible on your TA assignments. Consider these advantages:

- Being a TA can help you improve your speaking skills. Giving a course lecture or lab lecture is a way to gain experience in public speaking. Being able to give a good talk is a necessary skill if you wish to go into academia! Less formal TA activities, such as office hours or interactions in lab, also give you the opportunity to learn how to explain difficult concepts in a clear and concise manner.
- TA'ing a class allows you to learn more about that particular subject. Even if it is a class about your field of interest, you probably don't know everything about the subject, and can learn something from the students and the professor.
- Having teaching experience is important when looking for a job in academia, particularly at liberal arts colleges or large state universities where teaching classes will definitely be part of your responsibilities.

Of course, not all TA assignments provide significant interaction with students (although you can always ask the professor if you can teach a lecture while they are busy or at a conference). You may decide that a grading-only TA is less important than

getting that manuscript published this term. Or, you may decide that it would be nice to get some teaching experience this term by giving a couple of "guest lectures" in the class you are TA'ing, and can sacrifice a few hours of research.

So now you have figured out how many hours you need to be successful at TA'ing, research, and classes… and it's more time than you actually have. Two ways of dealing with this problem are addressed below: being an efficient TA and how to deal with conflicts involving your time and priorities.

A. Tips to help you be an efficient TA:

I. Before the term begins (or at the beginning of the term):

- Establish your responsibilities with the professor and other TA's. Try to eliminate conflicts or misunderstandings before they happen.
- Make sure lab equipment and computers are in working order and you know how to fix them! Equipment that breaks down in the middle of a lab will waste huge amounts of everyone's time (and will be upsetting to you and the students).
- Get helpful hints, homework solutions, and words of wisdom from students that have previously TA'ed the course. You should always do the problem sets yourself so that you can answer students' questions, but having something to work with can be a great time saver.

II. During the term:

- Be organized! (even if the professor isn't organized)
    - Keep updated spreadsheets of grades.
    - Always grade by a grading scheme so that if a student comes to you wanting points back you can address the problem quickly and fairly.
    - Make a simple TA or class website and post clarifications or corrections to problem sets and important due dates. Then the students won't need to constantly ask you about these details, and they can find this information at any time. A class e-mail list is also an easy way to make sure information gets to students, TA's, and the professor!
- Try to grade a problem set all in one sitting. This can be difficult because of lack of meaningful due dates in some classes. If the professor doesn't want to have firm deadlines for assignments, arrange for a compromise. For example, if a problem set is turned in late, you don't need to have it graded until the end of the term. Or, you

can wait until you have most or all problem sets until you grade them. If you do this, make sure that the students and professor know about this policy—peer pressure might make everyone turn their homework in on time!

- Set limits on the times when students can find you to ask questions. Establish office hours or a weekly help session and post times on the web site. However, don't blow up at a student if they find you at another time. If they come looking for you, consider it a compliment—it means you are a useful TA. Help them with their problem and then remind them of your office hours for next time.

B. Solving conflicts

Conflicts can occur between an advisor or professor and a graduate student when these people have different ideas about how the student's time should be spent. Internal conflict can also occur because a graduate student can't physically accomplish everything they are supposed to do.

I. If you are working yourself too hard:

Caltech students are smart and work hard, and often they put enormous pressure on themselves to do everything perfectly. This is generally an impossible task to accomplish when a student is expected to spread his or her time over multiple tasks. At some point we, the students, must learn to "let it go". How many professors do you know who have piles of unfinished work on their desks? Having well-defined priorities is crucial to wading through unmanageable loads of work (see above). For example, you may decide to put off grading a problem set until the weekend so that you can finish the experiment that is finally working! Here are some ways to get help with self-imposed stress:

- You are not alone! Other students have experienced similar difficulties. Talk to other graduate students about how they dealt with having too much to do.
- Talk to someone outside Caltech—a member of your family or another friend. A different perspective on the situation at Caltech can help.
- Some periods of time may be more stressful than others (for example, midterms, around your oral exam, proposal deadlines). When this happens, see if you can delay or swap responsibilities with others. For instance, if you need to take three midterms, but the other TA is not taking any classes, ask him or her to take over your TA responsibilities for that week. Then, you can make it up to them at a later time.

- Don't forget to sleep!!! The amount you can get done by working for 20 hours and sleeping for 4 hours is probably not a lot more than you can do by working for 10 hours, sleeping for 10 hours, and goofing off with friends, family, and pets for 4 hours. Your efficiency will increase by getting a decent amount of sleep, and the quality of your work will be higher. Sleep and exercise help to reduce stress.
- If you need someone else to talk to, you can go to the Caltech Counseling Center, located in the Student Health Center. They will talk to you about your problems and find ways to help you relieve stress. The Counseling Center website is http://www.counseling.caltech.edu. Their extension is x8331.

II. If others (the professor or your advisor are probably prime culprits) have entirely unrealistic expectations of what you should be doing:

There are a number of ways to resolve conflicts between the TA, and the professor of the course or your research advisor. However, all of them require you, the TA, to take the initiative:

- Talk to a trusted friend or fellow grad student (or fellow TA) about the problem.
- If you are having a conflict with the course professor, talk to your research advisor about the problem (if you feel comfortable doing so). Each division also has an academic officer and each option has an option representative who may be able to help you with TA problems. If your advisor expects you to TA without spending any time doing the work, talk to the professor of the class.

If you don't feel comfortable bringing up the problem with any of those involved, you can talk to the Ombuds Office. The Ombuds Office will listen to your complaint, and can arrange mediation or a meeting in neutral territory. Their powers are very limited, however. For example, they can't order a professor to do something. They can insure that you will not be retaliated against if you come to the Ombuds Office for help. More information is available at the Ombuds Office, http://www.its.caltech.edu/~ombuds/. Their extension is x6990.

Teaching and Your CV

By TA'ing at Caltech, you help your students learn, assist your professors in the teaching and administration of courses, and hopefully enrich your own experience here. Your teaching activities can also provide lasting benefits to you in the form of increased confidence, new skills, and important experience on your resumé or CV. As you perform each TA assignment, remember to consider what you can carry away from the experience and how you can document it for future reference.

A particular tool used in academia, the "teaching portfolio," is described in more detail below. However, no matter what field you enter after Caltech, your teaching experience can be valuable in many ways. Here are just a few examples:

- Teaching can improve your speaking skills and your comfort in giving formal or informal presentations.
- Some head TA positions give experience in managing personnel and delegating tasks.
- Innovative teaching can be a valuable illustration of your creativity and initiative.
- Successful teaching shows that you communicate effectively and work well with other people.

The Teaching Portfolio – what is it, and do I need one?

Teaching portfolios are relatively new tools used to describe your teaching work. Ideally, they help you monitor and improve your teaching, help you market yourself in the ever-competitive academic job market, and raise the profile of teaching in the academy. If you have plans to teach in the future, building a teaching portfolio at the outset of your career can help you greatly when you begin searching for jobs. More and more institutions are requesting teaching portfolios from job candidates, so this can be a very useful document to have.

A teaching portfolio typically consists of several types of documents. For example, as a recitation TA, you might make up a syllabus for an hour-long recitation period, or create a handout to distribute to the students as practice or review. Although the teaching portfolio should not be a collection of all of the material you create for a class, it should contain some samples of lesson plans, problem sets, or other material you have created for teaching purposes. If you have a student who has benefited greatly from your guidance, you might ask them if you could photocopy their work and include it in your portfolio as a demonstration of learning.

Another critical component in a portfolio is feedback from the supervising professor, students, or your peers. Student feedback is very important; an easy way to gather information about your abilities is to use the evaluation form on the CPET website (and in this Handbook) and ask your students to fill it out at the end of the year. Written comments can be especially insightful and interesting. If you feel that you have done a particularly good job TA'ing for a professor, you might ask him or her to write a letter attesting to your skills. Also, if you know another teaching assistant whose work you respect, you might consider asking them to observe you teach and discuss your methodology afterward, and include positive comments in your feedback section. If some comments are poor, don't worry – evidence of improvement is very useful, and there will always be students who dislike a particular teaching style. [See "Getting Feedback" for more tips.]

Finally, and most importantly, your teaching portfolio should explain your teaching philosophy. This is a one to two page reflection on your personal pedagogical beliefs: how should courses be taught? What should students gain from a course in your specialty? What do you want the students to learn about science in general? What are your responsibilities as a teacher? It can be helpful to get together with some friends and discuss various ideas about teaching before writing your philosophy. The statement you come up with can be a very useful guide as you apply your ideas in the classroom. It's also useful to revisit your teaching philosophy at the end of a term and see whether your theoretical ideas about teaching work well in reality!

For more information on teaching portfolios, contact CPET. We can provide examples of portfolios, help you evaluate and improve your teaching, and offer feedback on your portfolio-in-progress. The Career Development Center can also help you with this and other ways to document your teaching for potential employers.

Resources for Improving Your Teaching

On-campus Teaching Opportunities:

1. **Tutoring**: The Career and Development Center (http://www.career.caltech.edu) maintains a list of paid tutoring positions.
2. **YESS** (Young Engineering and Science Scholars) is a 3 week program offering Caltech students the chance to teach accelerated 11th and 12th graders. This is a paid position. http://www.msa.caltech.edu/outreach.html
3. **FSI** (Freshman Summer Institute) offers the opportunity to mentor a Caltech pre-frosh in the laboratory for 4 weeks. Mentors receive a $2500 stipend.
4. **Saturday Academy** is 6-10 week course for local high school students run by the Minority Student Affairs office (http://www.msa.caltech.edu). This is a paid position.
5. **Bi 23 (Biology Tutorial).** You can develop and run your own pass/fail undergraduate class on a biological topic of your choice. Contact Professor James Strauss at straussj@caltech.edu.
6. **Caltech Precollege Science Initiative (CAPSI)** works with local schools to promote inquiry-based science education. CAPSI has opportunities for Caltech students to work with local area teachers and students. More information can be found at www.capsi.caltech.edu or by calling x.3222.

Another great way to get involved in teaching science and math is to join the **Caltech Project for Effective Teaching (CPET)**:

Phone: x6330
e-mail: ta@caltech.edu.
http://www.its.caltech.edu/~cpet

Campus Offices:

The International Student Programs (ISP) Office is the heart of Caltech's international community, and a great place to go with cultural questions or concerns.

Director: Parandeh Kia
Phone: x6330
2nd floor, Center for Student Services
http://www.isp.caltech.edu

The Caltech Women's Center offers support and advice to anyone, and is particularly helpful with gender-related questions and concerns.

Director: Candace Rypisi
Phone: x3221
2nd floor, Center for Student Services
http://www.womenscenter.caltech.edu

The Minority Student Affairs Office offers understanding, help, and support in solving the problems most often faced by minority students here at Caltech.

Dr. Erica O'Neal, Assoc. Dean and Dir. of Multicultural Education and Student Affairs
Phone: x6207
2nd floor, Center for Student Services
http://www.msa.caltech.edu

The Hixon Writing Center. In addition to providing consultation for students, the Writing Center can help with your ideas for designing writing assignments and incorporating writing in your course. This office also directs the ESL program.

Director: Steven Youra, x3706
appointments (x3610, mlind@hss.caltech.edu) or drop-ins
Dabney 1
www.its.caltech.edu/~writing/

You can obtain help with problems related to your own education, or the competing demands of your research and teaching duties, from the **Dean of Graduate Studies**.

Graduate Dean: Prof. Michael Hoffmann
Assoc. Dean of Grad. Studies: Parandeh Kia
Graduate Office Phone: x6346
2nd floor, Center for Student Services
http://www.gradoffice.caltech.edu/
e-mail: gradofc@caltech.edu

The Caltech Counseling Center is an excellent place to seek emotional support when you face challenges and difficulties. You can also refer students to them for assistance.

Director: Kevin Austin
Phone: x8331
Young Health Center, 1239 Arden Rd.
http://www.counseling.caltech.edu

When you have no idea who to turn to, or when you feel uncomfortable dealing with a problem through "normal" channels, one door will always be open to you. **Caltech's Ombudsperson**, Helen Hasenfeld, can help you or any of your students, be it just to find the right resource to help find an informal way to resolve problems. The office guarantees confidentiality, except to the extent required by law.

Ombudspersons: Helen Hasenfeld, Janis Schonauer
6 Dabney Hall
Phone: x6990
e-mail: helenh@its.caltech.edu, janislyn@its.caltech.edu
www.its.caltech.edu/~ombuds/

For problems with **classroom maintenance** contact the Physical Plant Service Center:

Vi O'Connor
Phone: x4717

Web sites and Reading:

A variety of web sites, journals, and books present interesting discussions and helpful resources on TA'ing and on college teaching in general. Refer to Appendix B for selected web and periodical resources, and to the Bibliography for books and articles that were used in the writing of this Handbook.

The Caltech Environment

Undergraduate Academic Standards and Policies

In dealing with undergraduate students, a familiarity with Caltech academic requirements and procedures can often be useful. We quote some relevant Caltech policy below; for a more comprehensive treatment, refer to the Caltech catalog or to the handbook for faculty advisors, available online at http://www.deans.caltech.edu/.

UASH: Undergraduate Academic Standards and Honors Committee

UASH is responsible for awarding a variety of academic honors and for ensuring that a consistent set of standards and rules is applied in academic matters involving undergraduates. UASH typically meets during the first week of each academic term.
Students may petition UASH for the following reasons:

Late Add/Drop

Change of Grade

Further Work

Underload

Reinstatement (after a student has been academically ineligible based on performance in a past term or terms)

Appeal of UASH Decision on Reinstatement

http://www.caltech.edu/subpages/acad.html

Photo by Bob Paz, CIT

Add/Drop Policies

Add/Drop cards must be signed by the course *instructor* and submitted to the Registrar's office by the appropriate deadline.

A grade of F will be given in any course for which a student registers and which he or she does not either complete satisfactorily or drop.

Students must petition UASH to add/drop a course after the deadline. Courses

dropped after "Drop Day" will appear on the student's transcript with the designation W (Withdrawn).
http://pr.caltech.edu/catalog/01_02/uginfo/regreg.html

E Grades ("Incomplete")

At their discretion, *instructors* may give students who have not completed their work for a course by the end of the term a grade of E. The grade E indicates deficiencies that may be made up without repeating the course (typically by Add Day of the following term). *Refer students to the instructor* to request an E.

I Grades ("Medical Incomplete")

The grade I is given only in case of sickness or other emergency that justifies noncompletion of the work at the usual time. Students may also request an I in cases of psychological issues such as depression. Students should be referred to the *Dean or the Associate Dean of Students* for approval.

Caltech Honor Code and Student Conduct Procedures

Creativity flourishes in an atmosphere of trust and respect and is inhibited by suspicion and disdain. The Honor System is an agreement among all members of the community to live and work together honorably, trusting implicitly in the honesty, sincerity, fairness, and consideration of others.

The essence of Caltech's honor system can be stated as follows:
Never take unfair advantage of any other member of the Caltech community.

Members of the Graduate Review Board (GRB) speak during orientation about the implications of this simple phrase, and more information is provided in the booklet "The Honor System: Graduate."

A few important points of the Honor System:

- The Honor System is very much a reality governing student life at Caltech.
- Ignorance of the rules is not an excuse.
- The Honor System covers all academic and a wide range of non-academic issues.

You need to fully consider your obligations under the Honor Code, not only as a student but also as an instructor. Appendix C of the booklet "The Honor System: Graduate" offers many specific suggestions with which you should become familiar.

The Board of Control (BOC) administers the codes for undergraduates, whom you may be teaching. Keep in mind that by contacting the BOC or GRB you are initiating a flexible, confidential, and rational process. The BOC Secretary can be reached confidentially at x6200. The names and e-mail addresses of the current BOC Chair and Secretary are listed at http://www.its.caltech.edu/~ascit/boc/roster.html. The names and e-mail addresses of the current GRB Chair and Secretary are listed at http://www.its.caltech.edu/~grb/. The GRB Chair can be reached by e-mail at grbchair@its.caltech.edu. You can read the Undergraduate versions of the Honor System Handbook on the web at http://www.its.caltech.edu/~ascit/boc/UGHSBook.html.

Board of Control

What happens when you contact the BOC regarding a suspected honor code violation?

When you contact the BOC, the BOC chair or the BOC secretary, together with another BOC member, will initiate a preliminary investigation to determine if there is sufficient

evidence to suggest that an honor code violation may have occurred. If it is determined that there is sufficient reason to believe that an honor code violation has occurred, it will be brought before the full BOC, which will make three decisions:

1. Whether or not an Honor System violation has been committed.
2. How to nullify the advantage that has been taken.
3. How to protect the Caltech Community.

The BOC members involved in the preliminary investigation do not vote on the case when it is brought before the full BOC.

All those appearing before the Board, and the Board itself, are expected to maintain absolute secrecy regarding case meetings of the BOC. Divulgence of any of the proceedings shall be considered a violation of the Honor System. One consequence of this strict confidentiality is that even if you bring the original information to the BOC's attention, you will not have privileged access to updates on the progress of the case.

Any person asked to attend a preliminary investigation may elect to be accompanied by any current or former Board member of that person's choice. A defendant attending a hearing of the full Board may elect to be accompanied by any one member of the Caltech community of the defendant's choosing.

Conduct Review Committee

The Conduct Review Committee (CRC) is an oversight committee which coordinates between the various bodies on campus which may be involved in the investigation and handling of issues pertaining to the Honor Code and student conduct. These include the Board of Control (BOC), the Graduate Review Board (GRB), the Dean of Students, and the Director of Residence Life. A case is typically brought to the attention of the CRC when it is not immediately obvious how it should be dealt with. A Routing Committee first determines if the case should go to the BOC, CRC, or another office. Some student conduct cases which are not primarily Honor Code issues are then heard by the CRC itself.

Honor Code Issues and TA's

One commonly encountered honor code issue facing teaching assistants is the question of collaboration on problem sets. This seems to be a consequence of different

initial assumptions on the part of undergraduates and graduates with regard to collaboration policies.

Typically, the understanding among undergraduates with regard to the collaboration policy is that collaboration is allowed unless explicitly prohibited, as is the use of material such as notes, problem sets, and solutions from previous years, which are usually on file in the library. The usual test to distinguish between collaboration and merely copying someone's answer is an understanding of the solution, and the ability to reproduce it without referring to it.

The best way to avoid any misunderstanding is to ensure that the collaboration policy is made explicit in the course syllabus at the start of the course.

An issue mentioned above, but worth emphasizing at greater length, is the use of previous years' homework keys by students working on current problem sets. This practice is so common at Caltech that some undergraduate Houses even keep their own archives of past solution sets. Students may well assume use of these keys is allowed unless the professor and TA's explicitly state otherwise.

One other common concern is the potential abuse of extensions. A good policy to adopt is to have perhaps one or two fixed-period extensions, say a week, which the student may choose to apply at their discretion. Any further extensions should only be granted when a Dean's note or a medical excuse is presented. As before, extension policies should be made explicit early on and strongly adhered to.

Workplace Policies / Harassment Policy

Caltech has a commitment to providing a work and academic environment that is free of physical assault, unlawful harassment, and unlawful manufacture, distribution, dispensation, possession or use of illicit drugs and alcohol. The Institute's various policies are available on line at http://cit.hr.caltech.edu/policies/policies-main.html. It is important that all teaching assistants take time to read these policies and become familiar with the issues that can ensure that all members of the community are treated with respect.

The Harassment Policy in particular outlines issues that are pertinent to Teaching Assistants, so we treat it in a bit more detail in these pages. The bottom line for TA's (or others in a position to influence grades, salary, and/or employment) is that **you may not date your student(s)**, nor may you participate in romantic or sexual relationships with them. Your position as a TA creates a power differential between you and your students. If you initiate a relationship with a student -- or even tolerate advances from a student -- you are putting yourself, the individual student, and the rest of your class in an untenable situation.

You certainly want to have friendly and informal relationships with your students. However, to repeat, it is Caltech policy that **you may not date your students.** (For further clarification, see also the Caltech Catalog under "Graduate Assistantships.") It might happen that a student pursues a romantic relationship with you and you are convinced that you can remain unbiased in your classroom treatment of this individual. Nevertheless, this arrangement will probably be seen as unfair to others in the class, who perceive that the student has academic advantage because of this relationship. The Caltech policy specifically states that consent in a TA-student romantic relationship will not be considered a defense in a claim that the Institute policy has been violated.

The best advice for TA's who find they are attracted to one of their students is to wait until the end of the term before pursuing a romantic relationship. If someone with whom you are already involved is enrolled in your class, you must confer with your faculty supervisor. Other arrangements will then be made so you are not grading or evaluating his or her work. The Dean of Students, the Dean of Graduate Studies, and the Ombudsperson are also available for assistance. Their contact information appears in the "Resources" sections of this manual.

Some excerpts from the Institute Policy on Unlawful Harrassment and from the Guidelines Regarding Harrassment, are give below for your information. The full documents, including any updates or revisions, are available at the url given above.

It is the policy of the Institute to provide a work and academic environment free of unlawful harassment and retaliation. Harassment is the creation of a hostile or intimidating environment, in which verbal or physical contact, because of severity and/or persistence, is likely to interfere significantly with an individual's work or education, or adversely affect an individual's living conditions. All students, staff, and faculty should be aware that the Institute will not tolerate any conduct that constitutes illegal harassment. **Harassment in any form based on sex, race, color, age, national origin, disability, religion, sexual orientation, or any other characteristic protected by state or federal laws, is prohibited, as are all forms of sexual intimidation and exploitation.** All complaints of sexual harassment will be promptly and thoroughly investigated and appropriate corrective action, including disciplinary measures, will be taken when warranted.

Management, faculty, students, and staff, at all levels, are responsible for maintaining an appropriate environment for study and work. This includes taking appropriate corrective action to prevent and eliminate harassment.

Some examples of incidents that may constitute illegal harassment follow:

- An advisor tells a minority student not to take a certain course because the advisor says that other minority students have had difficulty in the course.
- A disabled individual is not included in an off-site outing because of lack of mobility.
- A supervisor assigns only menial tasks to a minority staff member.
- An older employee is disciplined for insubordination when the same conduct is tolerated from younger employees.

Sexual harassment is unlawful, violating Title VII of the Civil Rights Act of 1964, as amended, Title IX of the Educational Code, and California state law. Sexual harassment is defined as follows: "Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when

1. submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment,
2. submission to or rejection of such conduct by an individual is used as the basis for employment decisions affecting such an individual, or
3. such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile, or offensive working environment, even if it does not lead to tangible or economic job consequences."

Some examples that may constitute harassment are:

- Unwanted sexual advances.

- Offering employment benefits in exchange for sexual favors.
- Making or threatening reprisals after a negative response to sexual advances.
- Verbal sexual advances or propositions.
- Verbal abuse of a sexual nature, graphic verbal commentaries about an individual's body, sexually degrading words used to describe an individual, suggestive or obscene letters, notes, or invitations.
- Unwelcome, intentional, and/or repeated touching of a sexual nature.

Faculty, students, and staff have the right at any time to raise the issue of harassment without fear of reprisal or retaliation. Any employee or student who feels that he or she has been sexually harassed should immediately bring the matter to the attention of his/her supervisor or any of the individuals listed below.

These individuals are available to members of the Institute community who seek information and counseling about the Institute's formal and informal mechanisms for resolving complaints. They will handle matters brought to their attention with sensitivity and discretion. They can also provide information about Caltech's complaint investigation and resolution procedures.

Deans
Student Affairs Directors (including Master of Student Houses)
Division Administrators
Division Chairs
Provost
Director, Employee Relations

The Institute also offers members of the Caltech community the choice of seeking confidential personal counseling outside the Institute's mechanism for resolving harassment complaints. These confidential counseling services are intended for the personal benefit of the individual and offer a setting where various courses of action can be explored. Those seeking this type of assistance should check with the offices listed below, each of which has its own mandate and guidelines for providing services:

Ombuds Office
Staff and Faculty Consultation Center
Counseling Center
Women’s Center

Undergraduate Research Programs

Research is a highly valued component of undergraduate education at Caltech. Most undergrads will participate in at least some research before they graduate, and your lab will probably have a few undergrads working in it, especially in summer. Your advisor may ask you to mentor, or maybe just monitor, one or more of these undergrads. The common types of undergrad research are:

A paid job. Your advisor may hire an undergrad on an hourly basis to do anything from buying supplies at the stockroom and washing glassware to working on an actual research project.

Class credit. Students may be doing research for units and/or for a senior thesis.

SURF (Summer Undergraduate Research Fellowships). The SURF program provides funding for 10 weeks of summer research at Caltech by undergraduates from any institution (or for Caltech students to work at other institutions). Students wishing to participate begin by writing, in collaboration with the proposed mentor, a grant proposal for a research project of significant intellectual content. Those who receive funding (~75%) engage in the research over the course of the summer, often under supervision of a graduate student or postdoc. At the completion of the research, the undergraduate student must submit a written report and present a poster or oral talk at the SURF seminar day in October, which is structured like a professional scientific meeting. Prizes are available for the best report (Marcella and Joel Bonsall SURF Prize for Technical Writing) and best talk (Doris Perpall SURF Speaking Competition). For more information see http://www.its.caltech.edu/~surf/.

MURF (Minority Undergraduate Research Fellowhships). Similar to SURF, but focused on underrepresented minority students. For more information see http://www.cco.caltech.edu/~murf/.

FSI (Freshman Summer Institute). Minority students matriculating to Caltech may participate in the six-week FSI program offered by the Minority Student Affairs office, comprising classes and four weeks of research with a Caltech grad student. Grad students may apply to become an FSI mentor; mentors are paid a small stipend.

Caltech Undergraduates -- a Brief Introduction

The social and academic life of a Caltech undergraduate tends to revolve around the house he or she belongs to. The house is an important unit in the Caltech support network as well, both formally (e.g. Resident Associates and Upper-Class Counselors) and informally. A house, of which there are seven -- Blacker, Dabney, Fleming, Lloyd, Page, Ricketts, and Ruddock -- is something of a cross between a fraternity and a dorm, in that the current residents have some measure of choice as to which freshmen they accept, but it is also inclusive in that all freshmen will be picked into some house. This results in each house having a distinctive character.

There are a couple of major stress points in the academic year which have a tendency to intrude on an undergraduate's academic performance.

Rotation and the first quarter

Freshmen pick into a house by a process known as Rotation, which runs during the first week of the academic year. It involves freshmen having dinner at a different house each day, followed by a reception wherein upperclassmen and freshmen get to know each other better to facilitate the "picks" decision. This harried week of socializing can cause some freshmen and upperclassmen to fall behind in their work right from the start.

Because of the Rotation process, freshmen are assigned to temporary rooms on their arrival at Caltech and then move after the first week of classes to their permanent House assignment; lost homework and textbooks are a common consequence of this second move.

Another common problem with freshmen in introductory classes is that they have a tendency to start skipping classes during the first couple of weeks since they feel that they have already studied the material that is being presented. Due to the rigor and fast pace of a Caltech course, however, such students often find themselves hopelessly lost after a few weeks.

Freshmen on Pass/Fail

Caltech freshmen tend to be competitive creatures, since their high school persona was in all likelihood defined by being the resident math/science whiz. The first two quarters of the freshman year are on pass/fail, with shadow grades being provided second quarter to give students an indication of where they stand, in anticipation of being on grades third quarter. These two quarters of pass/fail are intended to ease students into the notion of

collaborating on their academic work, and perhaps get the bottom half of the class used to being simply ‘average.’ Students eventually learn that there is no shame in being an average Caltech student, but the first couple of months leading to that realization can be rather traumatic.

One of the common temptations associated with second quarter is that ambitious freshmen tend to overload in order to maximize their last quarter on pass/fail, which can have disastrous results particularly for later courses which build upon material they have crammed into this quarter.

[Another consequence of freshman-year pass/fail is that TA's are often called upon to write the comments which freshman students receive in lieu of grades.]

Frosh grades third quarter

Third quarter introduces a number of fresh challenges, the real possibility of burnout, the stress of being on grades, and an increase in the workload, with the introduction of science menu courses, and remedial probability and statistics courses for students who did not have adequate mathematical preparation. Field trips in Ge 1, around the middle of the quarter, can result in students becoming substantially behind in their work, since it involves being away during the weekend, which is a significant part of when problem sets get done.

Ditch Day and Stacking

Ditch Day (“is tomorrow”) is a Caltech undergraduate tradition wherein seniors create massively elaborate puzzles (Stacks) for the enjoyment of the underclassmen. This occurs towards the end of third quarter, and the excitement and anticipation is heightened through a series of mock Ditch Days and senior announcements during house dinners.

Photo by Bob Paz, CIT

As a teaching assistant, you may be

informed of the date of Ditch Day, and it cannot be emphasized enough that ***this information is privileged and should be kept in confidence***. The seniors have invested a great deal of time and money in making Ditch Day a memorable experience, and it is a simple courtesy not to spoil the surprise by carelessly letting slip the actual date of the event.

The practical consequences of stacking for seniors include long nights involved in construction, late night trips to Home Depot, scouring the LA basin area for props to use in a stack, and of course getting hopelessly behind in work. Invariably, the best-laid plans fail to materialize, and in the week leading up to Ditch Day, seniors tend to give up all pretense of being full-time students in a mad rush to complete their stacks.

On-Campus Resources for Students

Undergraduates having academic problems can get lots of help, including free tutoring, through the **Dean of Students Office**.

Dean of Students: Jean-Paul Revel
Assoc. Dean of Students: Barbara Green
Center for Student Services
Phone: x6351
www.deans.caltech.edu
e-mail: deansofc@caltech.edu

Graduate students can consult the **Dean of Graduate Studies** and the other staff in the **Graduate Office**.

Graduate Dean: Michael Hoffmann
Assoc. Dean of Grad. Studies: Parandeh Kia
2nd floor, Center for Student Services
Phone: x6346
www.gradoffice.caltech.edu/
e-mail: gradofc@cco.caltech.edu

The Caltech Counseling Center is an excellent place to refer students who need emotional support. You can also contact them yourself for assistance with challenges you are facing.

Director: Kevin Austin
Young Health Center, 1239 Arden Rd.
Phone: x8331
www.counseling.caltech.edu/

The International Student Programs (ISP) Office is the heart of Caltech's international community, and a great place to go with cultural questions or concerns.

Director: Parandeh Kia
2nd floor, Center for Student Services
Phone: x6330
www.isp.caltech.edu
e-mail: oip@its.caltech.edu

The Caltech Women's Center offers support and advice to anyone, and is particularly

helpful with gender-related questions and concerns.

Director: Candace Rypisi
2nd floor, Center for Student Services
Phone: x3221
www.womenscenter.caltech.edu/
e-mail: wcenter@its.caltech.edu

The Minority Student Affairs Office offers understanding, help, and support in solving the problems most often faced by minority students here at Caltech.

Dr. Erica O'Neal, Assoc. Dean and Dir. of Multicultural Education and Student Affairs
2nd floor, Center for Student Services
Phone: x6207
www.msa.caltech.edu

Caltech's **Hixon Writing Center** is a resource where students can get help with any stage of the writing process. The ESL program also operates out of the Writing Center.

Director: Steven Youra, x3706
appointments (x3610, mlind@hss.caltech.edu) or drop-ins
Dabney 1
www.its.caltech.edu/~writing/

Most undergraduates become integral members of their House. Each house has a **Resident Associate (RA)**, usually a grad student, who lives in the house and advises its residents. They can be a good resource to refer students to when you don't know where to send them. **The Residence Life Office** can help you find the appropriate R.A.

Phone: x6194
www.its.caltech.edu/~reslife/ra.htm

When you have no idea who to turn to, or when you feel uncomfortable dealing with a problem through "normal" channels, one door will always be open to you. **Caltech's Ombuds Office** can help you or any of your students, be it just to find the right resource to help find an informal way to resolve problems.

Ombudspersons: Helen Hasenfeld, Janis Schonauer
6 Dabney Hall
Phone: x6990
e-mail: helenh@its.caltech.edu, janislyn@its.caltech.edu
www.its.caltech.edu/~ombuds/

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Appendix A: TA Evaluation Form

The form on the following page is an evaluation form designed specifically to obtain student feedback about the role of a TA within a course. This form is intended to supplement overall course evaluations, not to replace them. You can use this evaluation tool at the end of a term for a final evaluation or around midterms to provide you with guidance for the rest of the term. To increase response, you may want to consider attaching this form to the regular course evaluation or allowing your students to respond online.

This evaluation form was developed by CPET during winter/spring 2002, and piloted in Ch 1 at the end of the winter 2002 term. The form can be downloaded from the CPET website at www.its.caltech.edu/~cpet.

If you have questions or comments, contact CPET at cpet@its.caltech.edu.

Teaching Assistant Evaluation

Course: _____ Term(1st/2nd/3rd, year): _____
Professor: _____ TA:_____

The goal of this survey is to help me identify problems with my teaching and develop methods to improve. If there are problems with the course or quality of teaching in general, please use the end-of-term departmental evaluations to air these concerns. Your responses will be kept anonymous.

	very poor	weak	satisfactory	good	excellent	
What was your overall impression of the course? (including professor, TA, and course material)	1	2	3	4	5	N/A

Please rate your TA in the following areas:	very poor	weak	satisfactory	good	excellent	
1. Comprehension of subject material	1	2	3	4	5	N/A
2. Accessibility (has regular office hours, responds to email/phone calls)	1	2	3	4	5	N/A
3. Prepared for discussion and/or office hours	1	2	3	4	5	N/A
4. Enthusiastic	1	2	3	4	5	N/A
5. Communicated ideas clearly	1	2	3	4	5	N/A
6. Graded fairly	1	2	3	4	5	N/A
7. Returned work promptly	1	2	3	4	5	N/A
8. Kept equipment in good working order (Lab TA)	1	2	3	4	5	N/A

	never	seldom	sometimes	mostly	always	
Did you attend lectures:	1	2	3	4	5	N/A
Did you attend office hours:	1	2	3	4	5	N/A

Were review sessions useful? If there were no review sessions, would you have found them useful?

If you have additional comments, please add them here.

Appendix B: On-line and Periodical Resources for Teaching

All of these web sites can be easily reached via the on-line version of the TA Handbook, located at the CPET homepage:

http://www.its.caltech.edu/~cpet

Michigan State University's Teaching Assistant Program Homepage:

http://www.msu.edu/~taprog/

University of Massachusetts–Amherst Center for Teaching:

http://www.umass.edu/cft/

The American Association for Higher Education (AAHE):

http://www.aahe.org/

The National Science Teachers Association:

http://www.nsta.org/

The Synthesis Coalition:

http://www.synthesis.org/

The National Science Foundation's Division of Undergraduate Education:

http://www.ehr.nsf.gov/EHR/DUE/

The Journal of Chemical Education:

http://jchemed.chem.wisc.edu/

(Caltech has an online subscription; access it through Millikan's online journal database: http://ojdb.library.caltech.edu/ojdb)

Yahoo's list of Education Journals:

http://dir.yahoo.com/Education/Theory_and_Methods/Journals

The Council on Undergraduate Research: http://www.cur.org

Periodicals:

- *Journal of College Science Teaching Innovative Higher Education*
- *New Directions for Teaching and Learning*

- *The Teaching Professor* (monthly newsletter)
- *Journal of Chemical Education*
- *Journal on Excellence in College Teaching*

Electronic Periodicals (WWW Journals):

- *Journal of Statistics Education* (http://www.amstat.org/publications/jse/)
- *The Chemical Educator:* (http://link.springer-ny.com/link/service/journals/00897/).

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