"TA" MANUAL FOR PHYSICS DEPARTMENT TEACHING FELLOWS
Fall 2019

Introduction

Two years of active teaching experience form an important part of the study for a Ph.D. in Physics at Columbia. It is hoped that this experience will not only serve as a foundation for those of you who go on to careers in teaching but will also be of value in preparing all of you to make effective oral presentations at future seminars and professional meetings. Moreover, learning to give clear explanations and answer students' questions in introductory courses contributes substantially to your understanding of the fundamental concepts of physics.

We welcome your participation in the teaching program at the Physics Department. We hope that you will find this aspect of your graduate career rewarding and that you will help to strengthen our undergraduate program by specific suggestions for its improvement.

Teaching Duties

As a Teaching Fellow, you will be expected to:

i). Teach 10 or 11 regular 3-hour laboratory sections during each semester. This includes preparation and grading of laboratory reports. There are up to 15 students in each section.

ii). Hold regularly scheduled "office hours" for 1 hour per week each in the Help Room and in the Lab Library.

iii). Occasionally (two or three times per semester) help proctor an examination.

iv). Participate in the grading of two midterm exams and a final exam each semester.

v). Attend Teaching Assistant (TA) meetings throughout the semester.

General Obligations

As a member of the teaching staff, representing the university in all interactions with your students, you will be expected to follow generally accepted obligations of the teaching profession:

Responsibility—Meet all teaching assignments promptly and fully prepared. It is unconscionable to waste the time of students by your lack of preparation or carelessness.

Impartiality—Treat all students fairly and be sure that, through your personal interactions, you foster the perception of fairness. We also aim to provide an inclusive environment, welcoming to all students.

Consistency—Although there is no intention to stifle your individuality, you must be consistent with the other teaching assistants in the level of demands which you make on the students and the standards by which you grade them.

Professionalism—Maintain proper decorum and discipline in the classroom/laboratory. Do not belittle students. Bring criticism and suggestions for improvement to the faculty or preceptors, but don't "put down the system" to the students.

Grading and Proctoring Obligations

As Teaching Fellows, you play an important role in determining the quality of undergraduate studies in the Department of Physics. Your knowledge of departmental procedures and deadlines regarding grading and proctoring is of vital importance. You are required to provide faculty and the departmental office with information necessary to evaluate students' performance within courses and laboratories. The departmental office itself is responsible for submission of grades to the Registrar. The Registrar sets strict time deadlines for submission of grades, so it is necessary that you adhere to the deadlines set by the departmental office. Departmental office staff and the preceptors will provide you with exact information regarding the specific duties of grading and will serve as an excellent resource should questions arise.

Information on Undergraduate Introductory Courses

"Alpha" sequences are primarily for physical science and engineering students, with calculus.

1) Two 3-semester sequences (UN1401-UN1402-UN1403; UN1601-UN1602-UN2601) with follow-on lab (UN1494) for students who elect/need to take it:

First Year Fall:
- UN1401 Introduction to Mechanics and Thermodynamics
- UN1601 Physics I: Mechanics and Relativity

First Year Spring:
- UN1402 Introduction to Electricity, Magnetism, and Optics
- UN1602 Physics II: Thermodynamics, Electricity, and Magnetism

Second Year Fall:
- UN1403 Introduction to Classical & Quantum Waves
- UN2601 Physics III: Classical & Quantum Waves
- UN1494 Introduction to Experimental Physics (after having completed UN1401 and UN1402 or UN1601 and UN1602)

Second Year Spring:
- UN1494 Introduction to Experimental Physics (after having completed UN1401, UN1402, and UN1403 or UN1601, UN1602 and UN2601)

2) A 2-semester accelerated sequence for a small group of selected students (primarily freshmen) entering with Advanced Placement in math and physics:

Fall: UN2801 Accelerated Physics I
Spring: UN2802 Accelerated Physics II

Students in the above sequences will generally be from Columbia College (CC), the School of Engineering and Applied Science (SEAS) and General Studies (GS).

"Beta" sequences are primarily for liberal arts and premedical students, with limited calculus.

The sequence lasts two semesters and consists of UN1201-UN1202, with some calculus, primarily for premedical students, and laboratory UN1291-UN1292. Students will generally be from Columbia College (CC), General Studies (GS) and Barnard College (BC).

Note: The following page contains a list of specific courses and information concerning these courses. The UN prefix indicates that these are undergraduate-level courses.

Textbooks for Introductory Courses

Course	Points	Instructor	Course Title	Textbooks used for the course
UN1201 (sec. 1)	3	Shaevitz, Michael	General Physics I	Halliday, Resnick & Walker: *Fundamentals of Physics, Extended, 11th ed.*
UN1201 (sec. 2)	3	Humensky, Brian	General Physics I	Halliday, Resnick & Walker: *Fundamentals of Physics, Extended, 11th ed.*
UN1201 (sec. 3)	3	Budick, Burton	General Physics I	Halliday, Resnick & Walker: *Fundamentals of Physics, Extended, 11th ed.*
UN1401 (sec. 1)	3	Pasupathy, Abhay	Intro. to Mechanics & Thermodynamics	Halliday, Resnick, & Walker: *Fundamentals of Physics, Extended, 11th ed.*
UN1401 (sec. 2)	3	Zelevinsky, Tanya	Intro. to Mechanics & Thermodynamics	Halliday, Resnick, & Walker: *Fundamentals of Physics, Extended, 11th ed.*
UN1403	3	Rosen, Rachel	Intro. to Classical & Quantum Waves	Halliday, Resnick, & Walker: *Fundamentals of Physics, Extended, 11th ed.*
UN1601	3.5	Dodd, Jeremy	Physics I: Mechanics & Relativity	Young & Freedman: *University Physics. 14th ed.*
UN2601	3.5	Will, Sebastian	Physics III: Classical & Quantum Waves	King: *Vibrations and Waves 1st ed.* Sakurai: *Modern Quantum Mechanics 2nd ed.*
UN2801	4.5	Cole, Brian	Accel. Physics I	Kleppner & Kolenkow: *An Introduction to Mechanics.* Purcell: *Electricity and Magnetism*, Vol. II Recommended: *Feynman Lectures I and II*

Textbook Desk Copies for Recitation Instructors

Any graduate student who is teaching a recitation section can obtain a desk copy of the course's textbook from Joey Cambareri in the departmental office. The book must be returned to the department at the end of the semester.

Communication

In your roles as Teaching Fellows, your primary contacts will be with the T.A. Supervisor and Director of Undergraduate Studies (Prof. Jeremy Dodd), the two Preceptors (Elena Busch and Ioanna Kourkoulou), and the Undergraduate Administrative Assistant (Joey Cambareri). You will receive e-mails throughout the semester that give guidance and instructions for the various tasks that you will be expected to perform.

In addition, make sure to check the Preceptors' website (http://phys.columbia.edu/~preceptor) and Google Drive (https://drive.google.com/open?id=1IrnBGDg5S9oltlOiCslj7tizzfVupLqV) frequently for useful information, assignments and updates.

T.A. SUPERVISOR AND DIRECTOR OF UNDERGRADUATE STUDIES
Jeremy Dodd (854-3969)
Room 924 Pupin
e-mail: jeremy.dodd@columbia.edu

DEPARTMENTAL ADMINISTRATOR
Randy Torres (854-3366)
Room 704 Pupin
e-mail: rt2255@columbia.edu

ADMINISTRATIVE ASSISTANT
Joey Cambareri (854-3348)
Room 704 Pupin
e-mail: gc2019@columbia.edu

PRECEPTORS
Elena Busch and Ioanna Kourkoulou
Room 729 Pupin
e-mail: physicspreceptors@columbia.edu

UNDERGRADUATE LABORATORY TECHNICIAN
Jocelyn Rosenfeld (854-3327)
Room 510 Pupin
e-mail: jr3408@columbia.edu

TEACHING FELLOW OFFICES: 727, 728, 730, 731, 732 Pupin.
COMPUTER ROOM: 726 Pupin.
Each Teaching Fellow will have marked wooden slots in the hallway cabinet outside the 7th floor suite for receiving messages, lab reports, individual assignments, etc. from the undergraduate administrator and the preceptors. Teaching Fellows will share assigned mailboxes in the 7th floor lobby outside the departmental office for U.S. mail, C.U. mail, local mail, etc.

How to Conduct a Lab Section

Since the lab sections are small and the spectrum of student ability is wide, individual instruction should be stressed with considerable leeway in handling different students. However, there are basic rules that should be carefully followed:

a) Set a scrupulous example for students by opening the lab at least five minutes before its scheduled time and by starting lab sections promptly. (Notify the preceptors or undergraduate assistant (Joey Cambareri) as much ahead of time as possible if you are unable to meet your section because of illness.)

b) Admit only regularly assigned students to your laboratory, per the section rosters that are provided at the start of the course. Assignments are made only by the preceptors or undergraduate assistant, and you will be notified of any changes from the initial class lists.

c) At the beginning of the period, return the corrected lab reports from the previous lab to your students. You should indicate the median (numerical) score for previous week's lab reports.

d) Keep the length of any introductory talk about how to perform the current experiment to a minimum (10 minutes might be a good goal). It might be "easier" for you and the students if you were to tell them *exactly* what to do and how to do it, but they will learn much less that way. For some experiments, it is necessary to say quite a bit about the experiment, giving appropriate cautions about handling the equipment and demonstrating subtle points. For other experiments, very little instruction is needed.

In view of the permutations in scheduling the various sections, there may be unavoidable instances when some of the physics basic to an experiment has not been previously covered in lecture or in assigned parts of the text. In these instances, particularly when the experiment is a short one, it is advisable to spend time (perhaps 15 - 20 minutes) at the beginning of the period presenting the physics behind the experiment. Try to capture the interest of the students by sharing some history or practical or "cool" applications of the physics you're covering that week. (For example, for the double slit experiment you might discuss how self-interference causes the interference pattern to remain even when a single particle passes through the slits; however, if one attempts to measure through which slit it passes, the pattern is suddenly destroyed.) Your enthusiasm for physics is contagious!

If some students need more help than others, go over the material (theory or experimental work) with them individually or in groups of two or three after they have started, rather than trying to tell others more than they need at the start.

e) Without adequate preparation, it is very difficult for a student to do satisfactory work in the laboratory (particularly in Physics 1291-1292, where reports are written during the lab period). Sending weekly emails to your class reminding them of what lab is coming up, and what concepts are challenging helps and reminds the students to prepare. You should do what you can to encourage and check on the students' preparation. By observing a student's progress and asking pertinent questions, you should be able to determine when a student is not prepared. Letting a student know that you are aware of this specific deficiency is the most effective way to encourage better preparation for the next experiment. You may remind the student that the lab grade is based on preparation and performance as well as on the reports.

This kind of communication is difficult, we know, so here are a few guidelines:

- Be succinct.
- Do not be hostile. Do not be too authoritarian.
- Do not joke about it. This undercuts your sincerity.
- One calm, simple sentence that preserves both your dignity and the erring student's dignity is best.

Extreme cases of lack of cooperation should be referred to the Director of Undergraduate Studies.

f) Do not routinely permit several students to work together on a single set-up. Many of the experiments have 5 or 6 set-ups and are designed for students to work in groups of two or three. During the semester, change the student groupings at least once, and preferably twice, and inform the students in the first meeting of the semester that the groupings will be switched. Without supervision, many students will tend to congregate around and lean heavily on one very able student; do not permit this to happen.

g) Labs must end promptly at the scheduled time. If you notice that a student is not making sufficient progress to finish all of the work outlined in the manual, select with him/her a portion of the work to be completed - that is, eliminate some of the measurements. Approximately 45 minutes before the end of the period, all students should be writing up their lab reports, even if they have not completed all sections of the experiment. Inform the students that a careful analysis and write-up of a part of an experiment is more important than a poorly written analysis of the complete set of measurements.

h) It is very discouraging for a student to find some of the equipment in disarray, inoperative, or missing at the beginning of a lab period. It is your responsibility to see that each student leaves each set-up in a complete and organized arrangement before he or she is checked out to leave the laboratory. Before you accept the in-lab report (as in the "beta" labs) or initial the data sheets for an outside report (as in the "alpha" labs), check the student's lab station. Careful following of this procedure will also discourage petty thievery. It is your responsibility to notify the technician (Jocelyn Rosenfeld) if any piece of equipment is inoperative or missing in order for it to be repaired or replaced for the next lab session.

i) Do not permit students from the next lab to enter until your class is over and the next instructor has arrived.

j) If your lab is the last one of the day, please make sure that all windows and doors are locked before leaving the room. Under no circumstances may students stay in the lab room after the end of the lab section. This is for their safety, and for the security of the laboratory equipment.

k) The lab environment should be welcoming to all students. The Department will not tolerate any instances of discrimination, based on student identity or background. Please remember that many of your students will have little or no prior physics experience – your role is to encourage their learning – never belittle or demean any student.

Organization of Lab Teaching

T.A. Preparation

It is crucial that each lab instructor carefully perform each experiment with appropriate calculations and graphs before teaching the laboratory. No matter how well you understand the physics, you cannot guide the students satisfactorily unless you have taken measurements on the same apparatus and analyzed the data. Most of the experiments will be set up at least a week before your actual lab section in the Lab Library, 506 Pupin. You are expected to perform all the experiments at this time. For those experiments that are not set up in the Lab Library, you should make sure to perform the experiment in the assigned lab room during the week prior to your lab section.

T.A. Meetings

Regular meetings will be held during the semester for all those teaching a given sequence of labs. Attendance at these meetings is a required part of your teaching assignment. The agenda for the meetings will include discussion and clarification of the important features of the sequence of experiments coming up and of the ones being completed, pedagogical points to be stressed, exchange of information on equipment, format of lab reports, normalization of grading, etc.

Recording and Monitoring Students' Lab Grades

A spreadsheet (Excel) file with your students' names for your lab section will be given to you near the beginning of the semester. The file will have a space for recording the attendance, performance, and lab report grade for each lab meeting. You will be expected to fill out the file in Excel for each of your sections. At the end of the semester you will return it to the Director of Undergraduate Studies. It is very important that you input all information into this spreadsheet. This file will constitute the electronic archive of your students' participation. Be sure to keep a hard-copy backup of your files throughout the semester.

Absence Policy

Up to 3 total absences are allowed in a semester. 4 or more absences will result in an 'F' grade for the course. Excused absences are allowed if a student is ill, has a personal emergency, or is observing a religious holiday. In the case of illness, a note from the student's doctor or physician should be provided to the T.A.; in the case of a personal emergency, an email or note from the student's Dean or advisor should be provided to the T.A. Absences for religious observances require only that the student inform the T.A. Excused absences should be noted with an 'EXC' on your Excel spreadsheet. Absences that are not excused should receive a score of zero. One unexcused absence is allowed in a semester.

Lab Reports

Detailed instructions will be given for each lab sequence.

Lab Section Policy Sheets

At the first meeting of the semester, you should distribute to the students a short "policy sheet" describing important aspects of the course, the absence policy, and the components that you are looking for in a good lab report. You should prepare your own section policy sheet. Examples are provided on the Preceptor website, and will be discussed also at the first T.A. meeting of the semester. It is important that these policy sheets be distributed at the first meeting of your lab section, so that the students are clear about what is expected of them. This should help in avoiding situations later in the semester where students may state that they were not aware of a certain aspect of the course management or policies.

Lab Grades

Lab grades should be given on a 0-to-20 scale, with 0 meaning failure and 20 meaning truly outstanding. It is recommended that you use intervals (granularity) of 1 or 0.5 when grading on this scale. It is very important that you use a broad distribution when assigning grades for the reports, so that there is enough discriminating power in determining the final course grades in a given lab section. Many students are coming from U.S. high schools, where they are used to a specific correspondence between numerical scores and letter grades (typically: 90-100% corresponds to an 'A' grade; 80-90% to a 'B' grade; 70-80% to a 'C' grade). It is important that your students are aware that this grading scheme will not apply in the lab courses, and that the sections are to be "curved", as described below. You might start out by giving scores broadly in the 10-15 range, allowing room for improvement as the semester progresses.

In addition to handing out a "policy sheet" on the first day of class, it may be useful to give students a "Lab Report Format" sheet that details a breakdown of how you plan to grade their lab reports. This might include the names, points, and appropriate content for each section. An example is given on the Preceptor website or Google Drive.

At the end of the semester T.A.'s will calculate students' letter grades themselves, with guidance from the corresponding lecture course instructor and/or the Director of Undergraduate Studies. Your calculation should be based on the following approximate distributions. Note that the grading guidance is different for the Alpha and Beta sequence labs.

Since the students are graded according to the approximate distributions given below (that is, they are graded "on a curve"), it is essential that you provide feedback each week on their individual lab reports, and on the distribution of report scores for the section as a whole. It is recommended that you inform the students each week what the median (numerical) score was for the prior week's reports.

For "Alpha" sequence labs (1494):

The median grade should be around the B+/A- boundary, with approximately the following distribution in each section: A or higher: ~20% of the students; A-: ~30%; B+: ~30%; B or lower: ~20%. You will be asked to provide detailed comments on the performance of each student on an evaluation sheet at the end of each semester.
NB. There should be clear reasons for assigning a B or lower noted on your student evaluation sheets at the end of the semester.

For "Beta" sequence labs (1291,1292):

The median grade should be in the low A- range, with approximately the following distribution in each section: A+: ~10% of the students; A: ~20%; A-: ~30%; B+: ~20%; B or lower: ~20%. You will be asked to provide detailed comments on the performance of each student on an evaluation sheet at the end of each semester.
NB. There should be clear reasons for assigning a B or lower noted on your student evaluation sheets at the end of the semester.

If a student misses 4 labs or more — even if they are excused — he/she automatically receives an 'F' (failure) grade. Do not include in the grade distributions described above the students who receive F's.

Evaluation of Laboratory Students

To help faculty members in writing letters of recommendation, you will be asked to provide an evaluation summary for each of your students at the end of each semester. Use the following eight items for your evaluation:

K = KNOWLEDGE of physics principles

W = quality of lab report WRITING

E = ability in handling experimental EQUIPMENT

A = ability to ACCOMPLISH work without the need for frequent help

T = ability to complete work on TIME

M = MOTIVATION and interest in the laboratory course

C = CARE and thoroughness of laboratory work

S = ability to work well with other STUDENTS

You should rate each student for these items on the following scale of 1 to 5:

5 = truly outstanding
4 = very good (much better than the average student)
3 = good (average Columbia student)
2 = weak
1 = very bad

You need indicate only those items for which you have a strong opinion about the student.

As an example of what to enter in the "evaluation summary" field of the grade report:

Student 1 ---- K=3, W=4, E=3, C=3.
Student 2 ---- W=2, T=2.
Student 3 ---- K=4, W=4, E=4, A=5, T=4, M=4, C=4, S=3.

Additional remarks and observations may be written in the "additional comments" field. Some suggested adjectives are given on the following page.

Suggested Adjectives for Lab Student Evaluation (will be used by faculty members in writing letters of recommendation for students):

Unusually mature	Impatient
Unusually immature	Careful
Very conscientious	Neat
Curious	Likeable
Diligent	Sensible
Hard-working	Unusually smart
Lackadaisical	Had a strong physics background
Does the minimum	Overcame a weak physics background
Explores beyond the requirements	Literate, good writing skills
Good sense of humor	Analytical
Good sense of proportion	Open to new ideas
Lively	Consistently…… (Intelligent, efficient, etc.)
Intellectually honest	Outstandingly…….(fill in the blank)
Leans on others	The best physics student
Lazy	Wrote the best reports
Cooperative	Helps other students

A student may strike you as "smart but lazy,"
or "curious and hardworking,"
or "inefficient with his time but conscientious,"
or "strong physics background and very able,"
or "good writing skills but often weak on basic physics concepts."

Only mention things about which you have a strong opinion. If a student did not leave a strong impression about her/his intelligence or diligence, but was a likeable person, then that is all that you can justifiably report: "likeable person." In unusual cases, you may want to write a few sentences giving a specific example of the student's curiosity, helpfulness, preparation, etc. Feel free to write more than a phrase for each student. This will greatly assist the professors when they have to write a recommendation.

Proctoring Exams

General Information

The efficient proctoring of exams includes the following responsibilities: distributing and collecting test papers and exam booklets; keeping records of attendance; correcting ambiguities or omissions in the exam; and preventing cheating. The emphasis should be on preventing dishonesty (by careful observation, warning, changing seats), but if an obvious incident occurs it should be reported to the course instructor.

1. The lead proctor will pick up the following materials from the Administrative Assistant (Joey Cambareri) in the departmental office (704 Pupin) and bring them to the examination room at least ten minutes before the start of the exam:

(a) Question sheets

(b) Answer booklets (the so-called "blue books")

(c) Chart of seating assignments and several copies of seating lists (to be posted)

(d) Exam cover-sheet (see example on next page)

2. For a large class, make piles of the appropriate number of collated question sheets with answer booklets for each vertical column of assigned seats. This will minimize confusion in handing out papers at the beginning of the exam --- just have the papers passed from front to back in each column.

3. Assign seats to students whose names are not on the seating list, and add these assignments to the list.

4. Take attendance from the seating list. Indicate absences on the list and on the back of the coversheet. Write names of absentees on the blackboard so that students can correct attendance mistakes at the end of the exam.

5. Make a careful count of the number of students taking the exam. This is usually best done ½-1 hour after the start of the exam. At the end of the exam, two proctors should make independent counts of the number of exam booklets handed in (collate multiple booklets if a student has used more than one), and reconcile any discrepancies. IMPORTANT: Write both numbers on the exam coversheet.

6. If any corrections or clarifications are made to students in the exam, the same information must be transmitted immediately to the Office of Disability Services (ODS) for students taking the exam there. The lead proctor must call 854-6464 and e-mail dsexams@columbia.edu with the relevant information.

7. End the exam promptly at the designated time. IMPORTANT: Complete all parts of the coversheet.

8. Return all materials to Room 704 directly after the exam. If you proctor a test which takes place after departmental hours, please store them in the preceptor's office (729 Pupin) until the following morning. It is the lead proctor's responsibility to ensure that exam materials are returned to the departmental (or preceptor's) office. The exam materials are not to be kept in Teaching Fellow's desks and may not be taken out of Pupin Hall.

9. The preceptors or graders will then pick up the examination materials from the departmental office.

EXAM COVER SHEET

Course _____ Date of Exam _____ Time _____ Room _____

Faculty Member's Name _____ Office(s) _____ Ext. _____

Exams to be graded and returned to faculty member by (date)_____

Additional Comments:

To be completed by Proctors

Name(s) _____

Number of students taking exam _____ Number of books received_____

On the seating list, indicate the names of students who are:

1. Not on Seating Chart but present at exam, and state where seated.

2. On seating chart but absent. Also list any other relevant information.

To be completed by Graders
(Copies of the exam & solutions are attached)

Exams will be stored in the Preceptor's room during grading. (You must grade them in the T.A. rooms to prevent loss and to enable other graders to work simultaneously.)

Question	Grader's Name	Comments
1		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Grading Exams

Grading Assignments

The preceptors will make grading assignments for midterm exams and finals. Assignments will be posted on the preceptor website.

Consultation with Faculty

The course lecturer will provide a written solution and point assignment for each part of each question. The grader must consult in detail with the lecturer before starting to grade. They should agree on the interpretation of the question and the assignment of partial credit for such things as arithmetic errors, units, etc. The lecturer will indicate the background of the question in terms of the lectures, text, and homework problems.

Preliminary Reading of Exams

Before actually starting to grade, look carefully at a small fraction of the answers to be sure that the grading procedure is appropriate. Often there is more than one way to arrive at a solution; this may require more than one scheme for partial credit assignment. While grading, always be on the alert for an unorthodox but correct solution to a problem. This is also very important for helping you stay consistent with how much partial credit you award for a particular kind of mistaken solution.

Grading Location

Exam scripts should not leave the 7th floor of Pupin at any time. This helps to insure that no exams are lost or misplaced. Grading should take place in the student offices or the graduate student lounge on the 7th floor.

Grading Schedules

In most cases, there will be a one-week period in which to complete the grading for a particular exam. Joey Cambareri will coordinate the grading schedules for each exam, indicating the date by which the fully graded scripts must be returned. It is essential that you adhere to the schedule, since course instructors rely on being able to return exams to students promptly. There will be sign-out sheets associated with each exam in the preceptor's office (729 Pupin) - you should indicate on the sign-out sheet when you took the exam scripts for grading and when you returned them and how many you took and returned. Exam scripts must be counted each time they are taken from and returned to the preceptor's office. In the case that the first grader collects the exams from Joey Cambareri, a sign-out sheet will accompany the exam scripts and should then be posted in the preceptor's office. The sign-out sheets will also repeat the overall grading schedule for the exam.

Duties of First and Last Graders

The first person to grade each booklet should put a red diagonal line through each empty, or partially

empty, page and should make sure that on the inside front cover there is an orderly column of numbers next to which the grade for each question can be recorded.

The last person to grade each booklet should first check that all of the pages have been graded (to make sure that no grader has missed an isolated part of an answer) and then total the points on the front cover. It is also requested that the last grader alphabetize the graded exams. This saves the office staff an enormous amount of time inputting the results of the tests in the administrative database.

After grading is complete, the lead grader will return all exam materials directly to the Administrative Assistant (Joey Cambareri) in 704 Pupin.

Standardized Marking of Papers

Use a red marker very liberally, i.e. put a check or a cross next to almost every equation or sentence, encircle any number or symbol that is incorrect, draw diagonal lines through all empty spaces, etc. This procedure serves several purposes:

(i) Indicates mistakes to students - single words or very short comments such as "units" or "wrong formula" are appropriate, but note that students will be given a complete set of solutions to exam questions.

(ii) Makes it immediately obvious to subsequent graders which material has already been graded.

(iii) Helps to prevent students from adding or changing answers after papers are returned.

In the margin next to each step in the solution (or section of a problem), keep track of how many points have been awarded based upon previously determined partial credit.

At the beginning of each problem, write an encircled fraction (e.g. 21/30) indicating the total number of points awarded for the entire problem divided by the total points possible. Then enter the total points awarded on the inside cover of the booklet. (This number should, of course, equal the number of points allotted to the problem minus the subtractions inside the booklet.)

After all grading has been completed, the last person to complete the grading totals the scores.

If you detect suspiciously identical answers on two papers, point this out to the course lecturer on a separate piece of paper and indicate on the cover sheet that you have done so.

No credit is given for numerical answers alone, unless work is shown.

Regrades

There is a formal procedure by which a student submits a request with a specific form (next page) to the staff in Room 704 for regrading. (This isolates the students from the grader.) You should be equally formal in handling regrades and make grade changes only in the cases of numerical errors or obvious oversights. Do not yield to challenges of your judgment if you have been consistent for all students.

We should discourage routine attempts to improve grades. In fact, you should be equally as willing to lower grades as to raise them in the rare cases where you decide to correct an error.

Make any changes or comments to students on the exam booklet itself.

Complete the regrade form and return it with the booklet to the Undergraduate Assistant in Room 704 for recording appropriate changes and filing. The lecturer will review all regrades before returning booklets to students.

PHYSICS DEPARTMENT

Request for Regrading Form

Name_____ Course_____

print name

Requests for regrading may be made only for matters of the following kind:

Mechanical errors in grading such as incorrect addition of exam scores, failure to give credit for an exam problem, etc.

Matters pertaining to the substance of the problem where there has been a misinterpretation of the student's solutions. In a request of this type, a complete solution must be carefully worked out below and used as a reference in the request. Use the back of this sheet or additional paper if necessary.

Requests should ***not*** be made for points lost for errors in units, or arithmetical errors. Credit deducted for these errors is ***standardized*** for the entire class. You should be aware of the fact that a request for regrading may lead to a lowering of the original grade, particularly if the request has no substantive basis. You cannot request a regrade more than ***1 week*** after the day the exam was returned.

Grader's Remarks to Student

This space for office use only

No change in grade _____ Grade changed from _____ to_____

Signature of grader _____

Help Room

Since many lecture sections have more than 100 students, it is crucial for the students to have additional help available for answering individual questions and aid in solving problems. Students are offered this assistance in the Help Room, 413 Pupin, where each of you will be scheduled to be in attendance for one (1) hour each week. After the first week of classes, when you know your schedule of graduate courses and teaching assignments, you will be asked to select a one-hour period for staffing the Help Room each week.

Your function in the Help Room is to answer specific questions that the student has about specific concepts or to help the student work out a problem which he or she has already tried to solve. In other words, in order to serve a maximum number of students well, you *should not* act as a general tutor to any one student or any group of students. You are not expected to answer questions such as "What do I have to know about angular momentum?" or to hold general review sessions.

What you *should do* is work with students in trying to get them to figure out solutions for themselves. Give them hints, indicate when they are on the wrong track, and ask them to answer the pertinent questions. Divide your time among the students who are waiting. Do not let one student monopolize your time. Of course, the major attendance will come just before scheduled exams. It may help to survey the students for common problems and do those first to relieve the crush. Note that Help Room is designed for students in any of the introductory physics courses, and therefore you should only give help for higher level classes if nobody else has a question.

You cannot be expected to be familiar with the details of all of the problems which have been assigned in all of the courses. You should not be ashamed to say, "I can't give an immediate answer to your problem, but let's try to work it out together." In most cases, solutions for assigned problems are distributed to the students after the homework assignments have been handed in. These solution sheets are available from the course instructors or in the Undergraduate Office.

Students with Disability-Related Accommodations

Some students may be entitled to disability-related accommodations, certified and approved by the University's Office of Disability Services (ODS), for their regular in-class work or exams, or both. Most often, such accommodations allow students extra time for assignments, although there are sometimes requests for note-taking services, specific classroom requirements, and the possibility to use computers for various class-related tasks. In most cases, students in the introductory lecture and laboratory courses will have had their accommodation requests processed by ODS. For lecture courses, the only consideration of student accommodations that is likely to impact your TA duties is that some students may be taking exams remotely, and that you must therefore transmit any information given in the main exam room to ODS as soon as possible (see the section on proctoring in this manual for further details). In the case of laboratory sections, students may provide you with a written approval of their extra time accommodation, for which our standard arrangement is to allow students the extra time immediately after the end of their section, with an agreement between the student and TA to submit their lab report at a defined time and location. Please let Jeremy Dodd know if you have students with ODS accommodations in your lab section, so that these agreements can be worked out as early as possible in the semester.

Students are only permitted accommodations once their request has been approved by ODS. If you have any questions concerning students with ODS accommodations, please contact Jeremy Dodd.

Possible Conflicts of Interest

In order to avoid any possible conflicts of interest during your work as a TA, please adhere to the following rules:

1. You may not participate in any private tutoring arrangement with a student for whom you are either a lab section or recitation TA.

2. We strongly discourage personal relationships between a TA and any student in a course in which the TA is participating. If such a circumstance arises, please discuss this with Jeremy Dodd, so that a re-assignment can be made to avoid any conflict.