Graduate Student Handbook 2022-23

Department of Physics

Oregon State University

USEFUL INFORMATION FOR NEW GRADUATE STUDENTS

Your campus mailing address: Oregon State University, Department of Physics, 301 Weniger Hall, Corvallis OR 97331-6507
Your postal mailing address: OSU, Dept. of Physics, 103 SW Memorial Pl. Weniger 301, Corvallis OR 97331-6507

Your office: Weniger 401

Main Office Phone: 541-737-4631

Your Email: ____________________

Main Office Location: Weniger 301

Important Names/Numbers

Kelly Carter – Office Manager/Graduate Coordinator, Weniger 303A, 541-737-1674
TBD/vacant – Undergraduate Coordinator/Office Support, Weniger 301, 541-737-4355

Registration Questions: Kelly Carter

Room Reservations: Online / Main Office

Office Keys: Online / Main Office

Overrides: Kelly Carter / TBD

Office Supplies: Main Office

Payroll: Kelly Carter

Instructional Labs: Fred DeAngelis, Wngr 315

Technology Support: Community Network, x78787

Purchasing: BennyBuy System

Reimbursements: Main Office for guidance

Travel: Concur online system

Tutoring List: Main Office

Resources:

Academic Success Center: 125 Waldo Hall; 7-2272; http://success.oregonstate.edu/
Campus Map: https://map.oregonstate.edu/
Counseling and Psychological Services: 500 Snell Hall; 7-2131 https://counseling.oregonstate.edu/
Disability Access Services: A200 Kerr Admin; 7-4098; http://ds.oregonstate.edu/home
Educational Opportunities: 337 Waldo Hall; 7-3628; http://oregonstate.edu/dept/eop/
Financial Aid: 218 Kerr Admin; 7-2241; http://financialaid.oregonstate.edu/
Find Someone at OSU: http://oregonstate.edu/findsomeone/
Graduate School Guide to Success: https://gradschool.oregonstate.edu/current-students
Graduate School Homepage: http://gradschool.oregonstate.edu/
International Services: University Plaza & ILLC; 7-6310;
https://internationalservices.oregonstate.edu/international-osu
Mathematics & Statistics Learning Center: 368 Kidder Hall; 7-4686; https://math.oregonstate.edu/mlc
New Employee Onboarding: http://hr.oregonstate.edu/inside-osu
Parking Services: Western Building, 850 SW 35th Street; 7-2583; http://parking.oregonstate.edu/
Physics TA Handbook: http://physics.oregonstate.edu/TA-resources
Registrar's Office: B102 Kerr Admin; 7-4331; http://oregonstate.edu/registrar/
Student Health Services: 201 Plageman Bldg; 7-9355; http://studenthealth.oregonstate.edu/index.php
Valley Library: http://osulibrary.oregonstate.edu/index2.html
Writing Center: 121 Valley Library; 7-5640; http://writingcenter.oregonstate.edu/undergrad-writing-studio

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
A TEACHING ASSISTANT'S HANDBOOK

This handbook is one of many means to assist you to become a better and more confident teaching assistant. It provides some basic information about matters particular to the OSU Physics Department, but also contains some guidelines about the art and science of teaching. It is posted on the Physics Department website at https://physics.oregonstate.edu/TA-resources.

If you are reading this document in electronic form, you should find that links to external url's are active. There are currently no internal links within the document, and unfortunately, the page numbers restart from Page 1 in each chapter. However, each chapter is an individual pdf document whose icon you should be able to click. For example in Adobe Acrobat, each chapter appears as a document in the "bookmarks" section. Future editions will have better navigation features.

Contents:

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
COURSES

The Physics Department offers several courses in which graduate students assist the instructor in various teaching roles. There are usually 20 –25 teaching assistants (TAs) depending on which courses are running. The courses listed below are those in which TAs are employed, but each course may not necessarily constitute a complete assignment. The department may also employ graduate students on an hourly basis to assist with grading in upper-division or graduate theory courses.

PH 104 (F,W,S) Descriptive Astronomy
Very popular introductory course. Subject matter makes this a very interesting class to teach. Lab assignments for TAs.

PH 106 (W, S) Perspectives in Physics (for non-majors)

PH 205 (F), 206 (W), 207 (S) Astronomy – solar system, stellar evolution, galaxies
Very popular introductory course. Subject matter makes this a very interesting class to teach. Lab assignments for TAs.

PH 201 (F), 202 (W), 203 (S) Introductory Physics without Calculus (lecture + laboratory + rec)

PH 211 (S,F), 212 (F,W), 213 (W,S) Introductory Physics with Calculus (lecture + laboratory)

PH 221, 222, 223: Recitation for Introductory Physics with Calculus
These introductory courses employ most of the TAs. The most common assignment for first-year students is as a lab TA. Recitations (part of the 20x courses, but separate courses for the 21x series) may also be assigned, but are more likely to be assigned to a second-year TA. All TAs hold office hours and assist with exam proctoring and grading.

PH 265 (F,S) Introductory Scientific Computing
The TA supervises computer labs. Programming is in Maple and Java. A first course in computing.

PH 314 (F,S): Introductory Modern Physics
This is a lab assignment. All TAs hold office hours and assist with exam proctoring and grading.

PH 331: Sound, Hearing and Music (aka The Physics of Music)
Baccalaureate core course for non-majors. Lab component

PH 332: Light, Vision, and Color
Baccalaureate core course for non-majors. Lab component

PH 411 (F), 412 (W): Electronics
This is a lab assignment. TAs should have a good knowledge of electronics.

PH 415 (S): Computer Interfacing
This is a lab course, and requires knowledge of computer interfacing and analog and digital electronics.

PH 320, 421-9 (F,W,S): Paradigms in Physics
Experienced TAs are assigned to the Paradigms sequence. TAs should be particularly interested in teaching – possibly even as a career. This is a demanding, but rewarding assignment. TAs generally attend the classes (especially in the first year), assist with in-class activities, including in-class labs, computer labs, and small group activities. They hold office hours and assist with grading. They work closely with the professor and attend meetings of the faculty involved in the paradigms teaching and development.

PH 365, 465, 466 Scientific Computing courses
The TA supervises advanced computer labs. Programming is in Maple, Java, and Fortran at least. TA is expected to be experienced at computing.

PH 481 (W) Physical Optics
This is a lab assignment in a relatively advanced course. The TA must have experience with optics.

PH 482 Lasers, PH 483 Guided Waves
These are cross-listed as ECE courses. TAs are from either ECE or PH. Lab assignment, optics experience required.

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
TA TIME DISTRIBUTION

TAs are appointed for the academic year while assignments usually change term by term. Each term consists of 13 weeks:

Fall: Sep 16 – Dec 15
Winter: Dec 16 – Mar 15
Spring: Mar 16 – June 15

A full-TA appointment in the Physics department is considered a 0.4 FTE appointment, and a half-TA appointment is 0.2 FTE (FTE = full time equivalent). No student may be employed at greater than 0.49 FTE. A 0.4 FTE appointment requires a maximum commitment of 208 hours per pay period (176 hours in 11 weeks for classes and final exams and 32 hours in 2 weeks for preparation). (See the Coalition of Graduate Employees webpage at http://cge6069.org/.)

Compensation includes a full tuition waiver for TAs with a 0.38 FTE or greater appointment and a stipend. Stipends are paid at the end of each calendar month for the work performed in that calendar month. Note that the first portion of Winter and Spring pay periods are during the break between classes in winter and spring respectively. The University does not recognize these as breaks for employees.

The work load does not fall evenly on a weekly basis. You should spread preparation work out to lower the peak burden. Remember to budget time for midterm and final exam grading in those weeks. Below is an approximate schedule, but adjust for the fact that the 15th of the month (last day of pay period) is not always a Friday (last day of academic term), and that winter break is 2 weeks and spring break is 1 week.

WEEK	RESPONSIBILITIES
*Week -1	-
*Week 0	Orientation (Fall)
Week 1	1st week of class (TA meet, no lab/rec, no OH)
Week 2-9	Full swing (lab, rec, OH, TA meet, 2 midterm exams)
Week 10	Dead week (OH, rec, makeup lab, TA meet)
Week 11	Finals (OH, proctor, grade, no lab/rec)

*Fall term only

Below is an approximate* time distribution for the average TA in introductory courses:

Activity	Per week or per exam	Total (hr)	Comment
Lab/rec	6-9	54-81	9 lab weeks
OH	2	20	10 OH weeks
Prep	3	27	9 prep weeks**
Grading/admin	3	27	9 weeks
TA meet	1	10	10 class weeks
Exam proctor	3	9	3 exams
Exam grading	9	27	3 exams
Additional tasks		34-7	See below
TOTAL		**208**	

* PH201/2/3 lab has 4 sections @ 2hrs/section; PH211/2/3 lab has 3 sections @ 3hr/section. Recitation has 6 sections @ 1 hr /section.

** One lab week is a makeup lab for which no preparation is required.

Answers to some questions:

• "Additional tasks" in the above table refers to time spent furthering the instruction in that course. Additional tasks may include training and/or extra preparation time for new TAs, mentoring activities for experienced TAs, curriculum development, or administrative assistance for the instructor. Other classes carry different distributions, and typically employ fewer TAs.

• If a TA is no longer a student, that TA may be required to refund the University for overpayment in certain cases. One example is if the TA withdraws from the University for just prior to winter term. Salary may have been paid for the last two weeks of December, but the TA will not take up duty for winter term. The salary is refunded to the University in that case. A second example is that of a TA who holds a thesis defense in the middle of the term, such that the final copy of the thesis is submitted in the middle of a pay period. The TA's compensation ends on the day the thesis is submitted.

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
FIRST WEEK PROCEDURE

First week …….

Welcome to the OSU Physics Department. We look forward to working with you as you assist in teaching the courses we offer, and we hope that you will enjoy teaching. There is no better way to learn than to teach, so we're sure this will be a rewarding experience for you. Here are a few things to get you started.

Most incoming students teach in one of the introductory classes listed below either as a lab TA (supervise laboratory sections) or a recitation TA (lead discussion and problem-solving sessions).

PH 201: INTRODUCTORY PHYSICS (Algebra based)
Instructor: Evan Thatcher, Wngr 141, evan.thatcher@oregonstate.edu

PH 211: INTRODUCTORY PHYSICS (Calculus based)
Instructor: Rebecka Tumblin, Wngr 411, tumblinr@oregonstate.edu

PH 212: INTRODUCTORY PHYSICS (Calculus based)
Instructor: Fred DeAngelis & Grant Sherer, fred.deangelis@oregonstate.edu; shererg@oregonstate.edu

PH 104: DESCRIPTIVE ASTRONOMY
Instructor: Randy Milstein, randall.milstein@oregonstate.edu

PH 205: SOLAR SYSTEM ASTRONOMY
Online, instructor: Kathy Hadley, Kathryn.hadley@oregonstate.edu

Obtain information to prepare for your first lab/rec (which will be in second full week of classes) by doing the following:
~Attend department TA orientation.
~Confirm TA assignments from department assistant chair during orientation week.
~Meet graduate mentors.
~Obtain TA key, lab books and/or course text (department office).
~Sign up for 2 office hours per week once your schedule is final.
~Register for TA seminar (1 unit, PH 607).
~Attend first TA meeting.
~Obtain syllabus (info about homework assignments, lab assignments).
~Specifics about course.
~Expectations for TAs in recitation and lab
~TA evaluation procedures

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
PROFESSIONALISM

Pro-fes-sion-al-ism *n.*

1. the conduct, aims, or qualities that characterize or mark a profession or a professional person
2. the following of a profession (as athletics) for gain or livelihood

You're beginning your career as a professional teacher and scientist, and it's a good idea to think seriously about yourself as a representative of your profession rather than yourself as an individual, a friend, a sibling, or a student. You are employed by the department and the university to teach students, to further their knowledge, to help them develop intellectual skills. You have a responsibility to work very hard to do this well and to constantly improve your own knowledge to do it even better. You have this responsibility towards each and every student in your class.

Honesty and integrity: Above all, you must be scrupulously honest in all matters, and your motives must be beyond question. Expect the same from your students.

Trust: Students must be able to trust you absolutely at all times and under any circumstances. Among other things, you should never share any information about a student without express permission, unless that information is being passed to a fellow professional with a legitimate professional interest in the student.

Fairness: Give all students every opportunity to learn and succeed. This may mean different treatment for students with different preparation, or different skills or deficiencies, but it is **never** based on personal, gender, racial, or ethnic considerations. In other words, it is only the characteristics relating to the profession that enter into different treatments, and even these different treatments have a common goal: maximizing the opportunities for students and increasing their knowledge and analytical abilities. Personal biases can be subtle. We must always examine and re-examine our professional conduct.

Respect: Students expect to be treated with respect, and in turn, they will respect you. You should never humiliate a student, and even telling students they are wrong is something you should do carefully and gently. Building knowledge is a delicate process, and the resulting edifice is often fragile. You can destroy confidence very easily without intending to. Very often, a student's "wrong" answer is evidence of an interesting thought process that is your job to analyze and reconstruct.

Reliability: Students have a right to expect that you will do the things you are expected to do in a timely fashion. This means you must always be well prepared, arrive on time, complete grading and other assignments on time, and you must be always fully engaged in your teaching duties during the assigned times.

Judgment: We formulate rules and laws to help us act in the right way, but written rules don't cover every circumstance. We're human, we change, and unforeseen situations arise that we need do deal with. Exercise good judgment, bearing in mind that you are setting precedent. Seek advice; be reasonable, polite, honest, fair, reliable, and respectful.

The above are very general principles. Below are some specifics that guide you within this particular context:

• If illness or other unforeseen circumstances arise where you cannot fulfill your teaching assignment (lab, rec or office hour), it is your responsibility to arrange for someone else to fulfill your assignment for you. Inform the physics office that you have done so (or tried and failed to do so).
• Dress appropriately. The university is a more informal environment than the business enterprise or the medical and legal professions for example, but you should be neat, presentable, and tasteful. No T-shirts with logos that could be construed as offensive, for example. The way you dress tells the students something about what you think about them. Be careful of the message you send.
• Classroom demeanor is important. It sets the tone for your relationship with your students. Being professional does not mean that you cannot display a sense of humor; on the contrary, humor is a means of establishing a comfortable environment. Use humor carefully as it may be construed in a manner you didn't intend.
• Don't enter romantic or emotional involvements with the students in your classes. Many TAs are close in age to most undergraduates and have similar interests, so it is natural that personal friendships and even romantic attachments form. These must be distanced from the professional relationship. The best tactic is to request reassignment, or wait till next term to pursue the personal relationship.
• Arrive several minutes early for labs and recitations. Classes must start on time, which means that **work begins** at the advertised time. End on time, too, so students can get to the next class. Remain in the labs at all times. Safety regulations require that students be supervised at all times. After a lab is over, make sure all the equipment is safely turned off and lock the room. If you allow students into the room for the next lab, you must remain in the room until the new TA arrives.
• Student assignments should be graded and returned very promptly, but no later than one week.
• Exam grading must be done promptly and fairly. Refer to the grading and proctoring section of this handbook.
• Report any instances of dishonest or unethical behavior on the part of your students (or, perish the thought, your colleagues) to the course instructor, department chair, or other faculty member with whom you are comfortable discussing such issues. Seek advice from these same people if you experience or observe what you consider inappropriate behavior by anyone you encounter professionally.

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY

THE LABORATORY – A TA's GUIDE

In the introductory courses, the lab equipment, student responsibilities, and TA responsibilities vary greatly. In some labs, the students take the measurements, analyze and record the data by hand, while in others, computers acquire, analyze and store the data. The latter are called MBL (Microcomputer-Based Laboratories). In some cases, the students are required to read the lab instructions and part of the textbook, and complete a pre-lab assignment before the lab begins. If they don't, then they aren't allowed to do the lab. In others, the students are required only to read the lab instructions and part of the textbook. In some courses, the TAs must check the students' work several times during the lab, and once at the end. The students can't continue the lab procedures until they have had their work checked. In others the TAs only check the students' work after they have completed the lab, unless they explicitly ask to have their work checked earlier. In the Modern Physics lab, the students may even be working on different experiments.

A typical lab:

The TAs are also responsible for guiding the students through the laboratory exercises, explaining how to use the equipment, pointing out dangers and pitfalls, making sure that the students learn as much as possible. The Socratic Method helps students learn the most. It involves asking directed questions instead of giving answers. This is a very subtle skill, and takes lots of practice.

For example, suppose a student has a circuit with two identical light bulbs in series with one another and in parallel with a third identical one, all in parallel with a big battery. The student asks which bulb will glow most brightly. Instead of answering directly, ask the student how much current will flow through each light bulb. If the student claims that current is being used up, then switch to an analogy with a water pump and three waterfalls, and ask the student if the water gets used up as it falls.

It is important to get the students to identify their misconceptions. If you simply tell the students the correct answers, they will think that they understand, and then proceed to make the same mistakes all over again. It's OK to leave students to ponder over a point while you assist other students, but be sure to return to resume the discussion, or you will leave them feeling abandoned and frustrated.

Sometimes everyone seems to have the same problem. In this case, politely interrupt the class and discuss the problem with everyone at once. This will save time for everyone.

You may begin each lab with a short introduction followed by a discussion where the students ask questions.

Preparation and general guidance:

Prepare adequately for each lab. Work through the lab yourself, preferably with the other TAs. Make sure you know how the equipment works and where the potential problems are. Arrive a few minutes before each lab is scheduled to begin. Return the student's work at the beginning of each lab. Write legibly on the board and speak loudly and clearly so that everyone can hear. Create a syllabus and distribute copies at the beginning of the first lab. Learn the names of your students as quickly as possible.

Evaluation of the students' performances varies with the course and instructor. Be sure your instructor has made grading policies clear to you. Be absolutely certain of the policy before your first lab, as you might be grilled on the minutest details of the grading scheme.

Feedback:

The course instructors would appreciate it very much if you would tell them how the labs could be improved. Let them know what works and what doesn't. Providing feedback in a written form works best.

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
RECITATION - A TA's GUIDE

#1: The students are clustered around a round table, excitedly debating the finer points of Gauss' Law, which you have thrown out for discussion. You have quietly retreated into the background. From time to time, students run to the blackboard, trying to convince their colleagues of some point by solving one of the prearranged problems you have presented.

OR

#2: Students are sitting in neat rows, in crowded classroom:

TA: "Any questions?”

Student in front row: "Yeah, problem 10.”

Long silence. Five students sit with pens poised ready to copy down TA's words of wisdom. Another 25 look out of the window because they've already done number 10. TA launches into 15-minute explanation.

If you can accomplish scenario #1, great! Don't allow #2 to happen. For most, there's a middle ground that keeps the students interested and serves them well. Many of you will be natural teachers; but you will all have to work hard at it. You are a vital part of the students' learning experience. Students often don't have enough time to absorb the principles that the lecture introduces before the next topic comes along. The lectures usually don't cover any but the simplest problems, so the students are horrified when the homework seems hard, even though they've "understood" the lecture. You have to help by reassuring them that they're not stupid (they aren't; they just think they are). You have to help them distill this knowledge.

• Ask questions that force students to apply the principles they've learned.

• Work problems that illustrate the important principles ... ask more questions and work more problems!

• Encourage students to participate and to work independently. Group mode in recitation, if managed well, is preferable to lecturing all the time. Students must not be passive listeners. It can be inefficient, though, and lecture mode is more appropriate to get summary information across.

• Encourage students to think logically and clearly. Teach them how to ask specific questions that identify their difficulties, not general questions like "How do I go about this?" (See the office hours handout.)

• Motivate them! Persuade students to tackle extra problems that aren't assigned, and to ask questions about what they've learned. Ask them about everyday phenomena and how their lessons apply. Many students have the feeling that if they show up, and do the homework, they'll get an A. They need to evaluate what they've learned, too.

In general, you shouldn't try to rederive formulae, or try to summarize what was learned in lecture, unless the students specifically request clarification. It's more beneficial to get some practice using the concepts. Pose conceptual questions that are not of the conventional "problem" type. For example, a conventional "problem" is to find the range of a projectile with initial velocity *v* angle □. To get students thinking, ask them to argue whether or not the range on the moon is different from the range on the earth given the same initial conditions. Some might want to obtain a formula and see how *g* enters; others might argue that the time to go up and down on the moon is longer because the acceleration is smaller, therefore the range is longer for the same horizontal velocity; yet others might just "feel" that it should be longer on the moon (maybe they've played golf at high altitude!). Your job is to pull out all these valid approaches and make sure that the students understand the physics.

Many texts divide their assignments into "problems" and "questions". Use both. Often you'll find a "question" that the students can discuss qualitatively relating to a numeric "problem".

How to encourage participation:

Your sections may be relatively large - 30 students, but this is at least smaller than the lecture.

• Divide the students into groups and assign each group a problem to work out. Have them tackle one of the other groups' problems if they finish early. You could have a spokesperson from each group present the problem to the class, but this mostly takes too much time in a larger recitation. This whole approach can be less efficient, and has to be managed well. However, the rewards are great. Discuss this approach with the faculty or experienced TAs.

• Ask a student to start the problem on the board and have the others help while you stand at the back of the room saying as little as possible. If a student refuses, don't insist, you'll find a willing student eventually. Once they get the idea, they'll all join in.

• Be careful of the ultra-smart student who volunteers all the answers - the recitation could end up as a discussion between the two of you. But do allow that student to have a say, otherwise a potential ally is bored to tears.

How to keep it interesting:

• Always be well-prepared and well organized, and have enough material so that you can talk the whole time if you have to. Don't be rigid, though; let the students dictate a little.

• Keep the pace lively. Don't spend too long on very easy problems. It's not necessary to work ALL problems through to the end, but most students get very frustrated when you don't, so do work some all the way through. In scenario #2, above, it would be much better to ask the student what he or she has attempted, and find out how many in the class are also having trouble with #10. You can then judge how much time to spend, and you have induced the student to participate.

How to start to be an effective TA:

• Plan your session well. Make good notes, and have a plan for how much time is assigned to each problem or activity. Be flexible during the recitation, but a good plan will help you keep on track.

• Be professional at all times. This includes treating the subject and the students with respect. Dress well; lose the coffee cup. Your demeanor will be an example to the students.

• Be punctual and return student work in a timely fashion.

• Appear confident, but don't be bossy or patronizing.

• Admit mistakes quickly, and rectify them.

• Write legibly on the board and speak so that everyone can hear.

• Establish authority and guidelines right away.

• Take an interest in your students; learn their names, their major field, but don't be drawn into personal conflicts. You're the TA, not the nanny.

How are you doing?

Ask experienced TAs if you can sit in on a section or two just to see how it goes. We have some very good teachers among the grad students. Ask the professor to critique your section early on in the quarter. He or she will do so later in the quarter, anyway. Some feedback early on will be useful.

Administration:

You have to evaluate the students' performances. This varies with the course and instructor. If you cannot objectively judge a student's performance, for whatever reason, please request that the student or you be reassigned.

The recitations in the PH211/2/3 sequence are graded P/N, and constitute a separate course. Attendance is usually the major criterion, along with two or three 5 to 10-minute quizzes during the term.

The recitations in the PH201/2/3 sequence are part of the course. Different instructors have different policies and you must know what they are. BE VERY SPECIFIC AT THE BEGINNING about what constitutes a passing grade, and stick to it.

Keep good records. It often happens that a student questions grades a term or so later. You will be given a class list - use it as a grade register. Your signature on student work is a good way of verifying later that it was actually done.

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
OFFICE HOURS – A TA's GUIDE

Office hours offer the opportunity for perhaps the nicest form of interaction with students: one-on-one with students who are interested and eager to learn (mostly one-on-one, although one often has a group of students, especially if you gain a reputation as a good TA!). Many of the points discussed with respect to the lab and recitations (see accompanying sections) can be applied to interactions with students in your office hours.

How to be effective:

• Use the method of asking questions about the students' questions so that they identify what their problems are. (See example in the lab section.)

• Teach the students how to ask you questions. It is not so simple ... many students come in with a resigned look and say, "I've really, really tried, but I can't do number 7." (Pleading look - save me.) When you ask what number 7 is about, they may simply give you the book, or read the question to you word for word. This probably means they haven't actively considered alternative strategies. They should be able to give a brief synopsis, and identify the main point of the problem:

> "Well, there's this dog with some mass *m* and the dog's walking on a boat in the water .... and you're supposed to find .... what ARE you supposed to find?"

This is good. Most of the time, simply identifying WHAT they're supposed to find helps students enormously. Don't help yet. Ask pleasantly, "How did you approach the problem?" If the response is, "Well, I couldn't do it", ask what the first step might be, and let the student take you through the problem. Save the students from terrible blind alleys, but let them pursue courses that you know will be unproductive for a while. You'll learn something about how they think, and teach them the valuable lesson about how to discover they're in such an alley, and how to get out of it.

• <u>Spotting errors</u>: If the students show you their first few steps, when you spot the mistake, don't just point it out and correct it (unless it's something really trivial) - try to get them to understand how THEY might have picked up the mistake. If it's a sign error, the result will invariably give the wrong limit; a factor dropped will make the units incorrect, and an incorrect substitution will give an unphysical answer. DEMAND that the students work with symbols to get through the problem, not numbers. They plug things in far too early, and get lost in a morass of numbers, and you can't figure out where they went wrong. (Remember when you used to do this?) These are the tricks of our trade: pass them on.

• <u>Order of magnitude calculations</u>: There IS a place for numbers - results have to make sense. Teach students to make meaningful substitutions and check results.

• <u>Management</u>: If you have many students wanting your attention, adopt a policy of answering questions on a rotation basis. Once a student has had one question answered, the student goes to the back of the line. Find students who are having problems with the same question, and group them together. If a student wants help with a problem you've just helped someone else with, get the student you just helped to explain (with your guidance if you have time). You never learn something until you teach it. You, and the students, would be wise to learn this lesson.

• Preparedness: Can YOU solve all the problems in the introductory text book? You should be prepared to, because you'll have questions from students in classes other than the one you're teaching. In particular, be prepared for students from PH 314 who are learning about relativity. Students have been led astray by TAs who don't really understand the material themselves. They're annoyed not that the TAs didn't know, but that they didn't admit it, and wasted the students' time. If you don't know, or are uncertain, go along to the professor (with student in tow if necessary) and learn. Instructors learn something new, or understand something at a different level, every time they teach introductory physics. You will, too.

• On-line homework: Physics courses may employ various types of on-line homework assignments. Be sure you have used the system that your class employs so you can help the students, but you are not expected to be an expert on the technicalities of every system. However, you should be able to help the students with the physics aspect.

• Enthusiasm: It goes without saying that you must be enthusiastic about what you teach. If you're bored, the students will be, too. Being enthusiastic includes being on time, or arranging for a substitute if you can't be there (and informing the office that you've done so). Find posters of interesting things in physics and stick them up in the room where TAs hold office hours. Examples are images of the comet fragments' collision with Jupiter, big periodic tables, posters about the lives of physicists, newspaper articles about physics things. Scan the web for interesting things. Some physics humor won't hurt our image either.

Once the students are suitably enlightened ("Gee, I really understand this now - you're much better than Prof. X - why can't YOU teach the lecture?"), take a moment to be happy about the job you've done, defend Prof. X if you're so inclined (No one ever understands fully the first time around!), but most important: tell the students to go home and explain the problem to someone else, or to see if they can redo the problem, without looking at the question (except for details like numbers) OR their solutions.

Many students are disillusioned that they can't figure it out on their own. "Well, I understand it when YOU explain, but I can never do it by myself." If you have been asking questions to help the student answer, rather than lecturing, you can point out that the student DID, in fact, do much of the work independently. The prodding necessary will decrease as the student's experience increases. Reassure him or her on this point.

Do not allow students to take advantage of your willingness to help by effectively completing an assignment for them. Your task is to model analytical thinking and problem solving. If you find yourself in a situation where your good will is being manipulated, seek guidance from an instructor or other mentor.

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
GRADING AND PROCTORING EXAMS

Part of the TA assignment is assisting the course instructor in grading and proctoring exams. As in all aspects of your TA assignment, the highest standards of professionalism are expected, but it is especially important in the testing process. We try to guide you with as much information as possible, but you will be required to exercise judgment, and we trust you to do this. These instructions are primarily directed to the large lecture series courses, and some variations occur for smaller courses. Exams in a particular course are held simultaneously in different rooms in different buildings during special evening sessions. Grading must be completed in a timely fashion. The instructor expects to return midterm exams no later than one week from the exam date. Final grades must be turned in on the Monday following finals week.

PROCTORING EXAMS:

1. You may be proctoring an exam without the instructor, or the instructor may be with you. Your role in either case is to ensure that the exam proceeds according to university procedures and that all students are given equal access to information. You also act as a conduit for communication between student and class instructor.
2. Instructors often have a pre-exam meeting to go over the exam. Look for ambiguities in questions. Make sure you have learned all pertinent information that the students have been given about the exam. Instructors assign students to exam rooms (usually alpha-order) prior to the exam and will inform students about information that is allowed in the exam. Calculators of a certain type may be allowed, or not. An equation sheet may be provided on the exam, or students may make their own information sheet.
3. Arrive at least 45 minutes (or more at instructor's discretion) before the test to meet the instructor who will go over the test, assign you to rooms, and give last-minute instructions. The instructor may wish to be in cell-phone communication with you.
4. Before the exam, hand out exam blanks and formula sheets (if any) so that students can fill in name and ID information <u>before</u> the exam start time. Prompt students to do this. About 3 minutes before the scheduled time to start, call for silence, distribute the test as quickly as possible, and <u>start the exam on time</u>.
5. Circulate during the exam, watching carefully for students who may be copying from someone else or otherwise disobeying rules. Do not sit and read or work or

be obviously disengaged. Do not carry on a conversation with your fellow proctor. No matter how quiet you try to be you will disturb the students, and you will be distracted from your duties. The course instructor may circulate from room to room to find out if all is going smoothly, and/or may be reachable by cell phone.

6. <u>Never</u> leave the room unattended under any circumstances, unless following emergency procedures for fire, earthquake, or power outage, in which case the room must be evacuated and the exam is then aborted.
7. Students may request clarification or ask specific questions. In general, it is OK to <u>clarify</u> language or usage. [OK: "Yes, the word ‘incident' means arriving from." Not OK: "The ‘incident' ray refers to the one that belongs to this angle in this formula."] Any information you supply must, in principle, be given to <u>all</u> students taking the exam. You may discover that some information is missing (or you think it is). If you suspect this, or suspect an error on the test, have one TA call the instructor immediately, and advise the student to go on to the next problem until you locate the instructor to discuss the matter. We hope such incidences will be rare and largely dealt with when you go over the exam in advance.
8. Students may ask for permission to leave to use the restroom. In general you should grant permission, but make a note of the student's name and how long he or she is gone. Restroom breaks have been a source of cheating in the past.
9. Count the number of students in the room once the exam is underway. Check with your co-proctor that you agree. Double check if you are alone.
10. <u>The exam must end on time</u>. This is to ensure equal treatment of the students in different rooms, and also because there may be an exam following yours that must begin on time.
11. When a student leaves take the answer sheet from the student, check the student's name on their ID against the that on the exam, and check for a likeness with the photograph. If these don't match, ask the student to remain until the course instructor arrives. If a student doesn’t provide ID (most will use their OSU ID but any photo ID is acceptable), note this on the exam and notify the instructor.
12. Count the turned-in exams to be sure they match the number of students. Losing an exam is completely unacceptable.
13. If you suspect a student of cheating you should call the instructor immediately, but in some cases you may have to confront the student yourself. Be polite and professional, and ask the student to remain until the instructor arrives. Report incidences <u>immediately</u>. Do NOT take the exam from the student, but you can mark which parts of the exam have been done up to that point.

Common sources of cheating:

- A student has another student take the exam for him or her (hence the ID check).
- A student copies from another, usually with the cooperation of the student who is being copied from. Both students are in violation of the rules.
- Students deliberately or inadvertently see another's multiple choice answers while waiting in the line to check ID and alter their own answers.
- A cheat sheet or worked problem has been left in the bathroom or outside somewhere, and a student uses a bathroom break to find the answer.
- A student uses a bathroom break to call a friend on a cell phone.
- Students in the exam communicate by email or instant messaging with an outside person or with each other during the exam (hence the need to circulate and closely monitor calculator use). **Cell phones are expressly forbidden, even for use as a clock.**
- A student alters exams after grading and return exams for a regrade (hence the need for careful grading procedures – see below).
- Worked problems are left on the floor before the exams and look like trash. Make sure the room has been cleared beforehand.

GRADING EXAMS:

1. Exams should immediately be returned to the office or to Weniger 305 and nowhere else.
2. Grading is done using Gradescope. The process begins with a TA, LA, or office staff member scanning the exams and loading the scans into Gradescope. The instructor assigns responsibility for grading particular problems to a TA or group of TAs, who will use Gradescope to complete the grading.
3. After scanning exams should be left in the office or Weniger 305 for the instructor, who is responsible for storing them for one year.
4. Weniger 305 may never be left unlocked when there is no one in it, even if the exams are locked in the cabinet. Lock the door if you leave even for the briefest period.
5. No undergraduate students are allowed in Weniger 305 at any time for any reason, unless involved in the exam process.
6. Grade the problem you have been assigned carefully, according to the procedure you and the instructor have agreed upon. Consistency is important and often difficult to achieve. Read a fair number of exams before you begin grading in earnest.

7. Indicate the type of error if you assign less than full credit. Extensive comments are not necessary, but a word or two helps the student and also the regrade process. Discuss the issue of providing feedback to students with the course instructor.
8. Never insult the student or write disparaging comments. A smiley face next to a disparaging comment does not make it less disparaging.
9. When assigning multiple rubric items to a problem, make sure you're not "double-assigning" points.
10. Regrade requests are made through Gradescope, which will assign them to whomever graded the question. Students usually have a fixed period in which they can make regrade requests. You should respond promptly, both as a courtesy to the student and to avoid complaints to the instructor.
11. The goal is to have the exams graded and get the grades to students within one week of the exam itself.

Thank you for helping!

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
GENDER & MINORITY ISSUES

Physicists and people in related "hard science" disciplines like engineering and materials science are overwhelmingly men, and, in the west, white men. Actual numbers are difficult, but it is not unreasonable to estimate that women make up 10-15% of physicists, and that people of color make up an even smaller percentage. This makes issues of minority and gender particularly important to us as educators. All evidence suggests that women and minorities are as capable as anyone else, so we must assess how our actions as educators influence the climate for those who do not make up the majority, and how can we make physics more accessible and welcoming to them?

These issues are discussed in the TA seminar, and here are some general, common-sense observations.

Even the most well-intentioned among us can say offensive things or act insensitively without knowing it. Addressing potential pitfalls in the physics context is important to all graduate students, especially teaching assistants.

Professional courtesy demands politeness and respect under all circumstances. Remember that your interactions with students are not social interactions, but professional ones. Think before you say something, and ask yourself how you would react to the same words under similar circumstances.

Stereotyping of many types is common in our society - racial; gender; professional. Recognize and avoid hurtful stereotyping, even in jest. Consider situations in which you might be in the minority and assumed to be inferior.

One common stereotype is that women and minorities are inherently worse at physics. Even if you don't subscribe to this view, attempts to avoid marginalizing these groups may lead to what might be considered patronizing behavior (are you, as a male or female TA, preferentially helping the women students?), or singling out people (do you ask the one black person in the room all the questions?).

Avoid the elitist "physicists are smarter/better" mindset. Inside jokes can reinforce prejudices (physicist/engineer, etc). There's a place for poking fun at ourselves and even at others, but it is seldom in the classroom.

Sometimes women tend to take on the "secretarial" role in a lab partnership, while men tend to claim the "driver" role and take charge of the lab equipment. It also happens in single gender teams. You should encourage these roles to be reversed if you see this happening. Your task is to ensure equal opportunity for everyone, and to ensure that everyone learns the necessary skills.

Try to ensure that the lone person in the class or lab is connected to a group. Most people benefit from peer interaction. Your first attempt may not work. Keep trying.

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
LABORATORY SAFETY

These instructions apply to research and teaching labs alike. There are also general safety issues that relate to classroom instruction. Accidents rarely happen, but when they do, it is important that you are prepared. Review this information before your first laboratory or recitation section:

1. Emergency phone numbers:
   The site https://publicsafety.oregonstate.edu/ has a list of emergency numbers that you should download to keep. Here is a partial list:

   911 from campus telephones reaches Corvallis emergency.
   737-7000: Public Safety / Campus emergencies.
   737-3010: OSU police at OSU (non-emergency)
   737-5000: Saferide program
   766-6924: Corvallis Police
   766-6858: Benton County Sheriff

   737-xxxx are OSU campus numbers and are reached by dialing 7-xxxx from campus phones. Dial 9 before dialing non-campus local numbers (but not before 911).
   Make sure you can give directions to the Physics department and to the particular lab you are in. Weniger Hall is located on Monroe Avenue and SW Memorial Place. It is the tallest building on Monroe and easily visible. The doors closest to most labs are the southeast exit to the parking lot between Weniger Hall and Gilbert Hall, and the southwest exit to the street (Memorial Place) between Weniger Hall and the Student Health Center.

2. Locate exits and know evacuation routes in the event of earthquake, fire alarm or power outage. In the event of such an emergency, immediately order students to cease work, and leave the building <u>without</u> gathering personal belongings.

3. Do NOT leave laboratories unattended under any circumstances while students are there. Accidents happen suddenly.

4. No food or drink in the lab. This protects the equipment from damage, and keeps the equipment and the room clean. Students can step outside to eat or drink if they need to.

5. Locate circuit breakers in each laboratory. Locate fire alarms in the hallways.

6. First Aid Kit in grad student break room (Wngr 385), and in lab prep room (Wngr 202) accessible from the labs Wngr 200, 204, 234, 258. The Student Health Center is across from Weniger on the west side (Plageman Bldg.).

7. Astronomy labs sometimes involve viewing from the Weniger roof. Pay particular attention that students do not wander near the edge of the roof. There is a barrier, but they can defeat it if they try. Always have your roof key with you – the roof door locks behind you and you need a key to enter and exit the roof. Never leave students unattended on the roof.

8. Find out from the course instructor whether any labs have particular safety hazards: high voltage or current, radioactivity, chemicals, heat, lasers. Appropriate instructions should be given to the students.

9. Special regulations exist for labs in which ionizing radiation is present. In general, these labs have restricted access, and entry is allowed only after a course from the Radiation Safety office, after which you are issued a photo badge. No undergraduate teaching labs involve such restrictions, but there is one PH314 lab involving low-level radioactive decay. The TA will be required to attend radiation training, but the levels are so low that no badges are required.

10. University insurance does not cover injuries to unauthorized people in the lab - your children, family and friends. Show them around the lab, by all means, but make sure that no unauthorized person is there without strict supervision.

11. There are extensive documents concerning all aspects of safety at the OSU Environmental and Health Safety website: http://oregonstate.edu/ehs/services.

    A few that may be particularly relevant are listed here (some are PowerPoint presentations):
    OSU Chemical Hygiene Plan
    http://oregonstate.edu/ehs/chp

    Section 1 - General Safety Rules
    http://fa.oregonstate.edu/saf-manual/100-general-safety

    Section 2 - Classroom Safety

http://oregonstate.edu/ehs/safety-instructions (click on Classroom Safety)

Section 16 - Lab Safety Rules
http://fa.oregonstate.edu/saf-manual/300-laboratory-safety

12. Personal safety. As you travel to and from a lab or recitation section, especially in the evening, be aware of your surroundings and take all reasonable precautions that you would in any city. Travel with someone else if possible, park your car close to the building, and carry a cell phone. Use the Saferide program, https://asosu.oregonstate.edu/saferide/order-ride. Corvallis is a safe community by national standards, but serious assaults on campus and in the wider community have occurred.

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
RULES & REGULATIONS

Oregon State University has rules and regulations that must be observed. Below you will find some basic information and a means to gain more information. It is your responsibility to make sure you are informed.

Release of student records:

It is expressly forbidden to release non-directory information about students, even to their parents or to law enforcement agencies. For example, information about gender, SSN or OSU student ID, and even the students' college are protected. It's safest to refer requests to the Registrar if you get them. Most important to TAs is that grade information is protected: you are not allowed to post grades by name or ID number, and you must post them in random order by some code known only to you and the student (sometimes the last 4 digits of the OSU ID number).

https://registrar.oregonstate.edu/guidelines-release-information

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
TA EVALUATIONS

TAs are formally evaluated by students and optionally by the course instructor each term. They may request informal feedback from students, mentor TAs, and instructors at any time.

The procedures described here are in flux as the department transitions from paper-based evaluation forms to online evaluations. Expect changes to the particulars of these procedures.

<u>Student evaluations</u>
Student evaluations are required by the University for all instructors (including TAs) in any course. Students in all laboratory sections and recitations are given the opportunity to complete the online “Student Experience of Learning” (SEL, formerly eSET) survey for the section near the end of the term. The results of the survey are shared with the instructor of the section (you), and the department after the term is over.

In addition, the department conducts its own survey of students through an online form distributed to students by instructors of the course to which the lab or recitation is attached. The students give written answers to a set of questions that you will find in the attached pages. These comments are anonymous. They will be shared with the department, the course instructor, and if desired, you.

You may choose to use class or lab time to encourage students to complete these surveys and increase response rates. If you do so, ten minutes at the beginning of class should be sufficient. Although the end of class may seem more convenient, the beginning is better, as some students may leave early or be in a hurry to complete the survey. LEAVE THE ROOM DURING THE EVALUATION PROCESS. You are not permitted to be present when the evaluations are being completed. Lab TAs: do not stray far from the lab during evaluations – you need to be immediately available if problems arise and students continue their lab work during this time.

The student evaluations can be frank, and are typically a useful indicator of TA performance. Student criticism is usually constructive, and negative comments tactfully stated. However, there are sometimes inappropriate comments, and occasionally even hostile ones. If there is cause for concern, consult the course instructor or department head.

<u>Instructor evaluation</u>:
Instructors evaluate your effectiveness as a TA by observing your lab and/or recitation sections, your participation in mentoring activities, and by their interactions with you in meetings and general discussion. They also receive the written student evaluations, and may receive verbal feedback from the students. At their discretion (or if you request it), instructors may write their own evaluations of the performance of their TAs based on all of this information. This evaluation becomes part of your file. An evaluation form that may be used by instructors is attached.

<u>When can you review your evaluations?</u>
The results of the departmental survey are typically shared with TAs after the term is over; ask the instructor if you wish to see these evaluations. The instructor evaluation, if completed, is part of your confidential file, but the instructor should review it with you, letting you know what strong points have been noted and what you need to work on. You are entitled to ask the instructor for feedback on your performance, and are encouraged to do so. If you request but do not receive student evaluations or instructor feedback, please discuss the matter with the Graduate Advisor.

TEACHING ASSISTANT EVALUATION SUMMARY
(To be completed by Instructor)

Course#___________ Section#_____________ Date__________________

Lab Recitation *(circle one)*

___________________________________ ____
Teaching Assistant ***Course Instructor***

A. Summary of student questionnaires.

B. Summary of Instructor's Evaluation.
Instructor: On the reverse is a form to fill in evaluating separate aspects of the TA's performance. The space below is for any comments that do not fit into that format.

B. Summary of Instructor's Evaluation (cont'd)

(Instructor: Rate these 7 items, checking any criteria where issues/strengths are noted, commenting as appropriate.)

TA's Effectiveness as a Teacher

1. Preparation (*circle one*): ---> Exceeds Expectations Meets Exp. Does Not Meet Exp.

___ *On time to class?* ______________________

___ *Knows the physics?* ______________________

___ *Knows the lab manual/text?* ______________________

___ *Knows the lab apparatus?* ______________________

___ *Knows course policies and news?* ______________________

___ *Specific, aligned plan for each session?* ______________________

2. Classroom Management (*circle one*): ---> Exceeds Expectations Meets Exp. Does Not Meet Exp.

___ *Uses class time efficiently?* ______________________

___ *Distributes individual attention evenly?* ______________________

___ *Good rapport with students?* ______________________

___ *Adjusts well to circumstances?* ______________________

3. Communications Skills (*circle one*): ---> Exceeds Expectations Meets Exp. Does Not Meet Exp.

___ *Legible writing?* ______________________

___ *Audible speaking?* ______________________

___ *Able to offer multiple explanations?* ______________________

___ *Coherent structure to presentations?* ______________________

TA's Professionalism

4. Preparedness Outside of Class (*circle one*): -> Exceeds Expectations Meets Exp. Does Not Meet Exp.

___ *Present/available for full term?* ______________________

___ *On time to meetings and events?* ______________________

___ *Organized and informed?* ______________________

___ *Current and prepared for office hours?* ______________________

5. Contribution to the Course (*circle one*): ---> Exceeds Expectations Meets Exp. Does Not Meet Exp.

___ *Fair and conscientious grading?* ______________________

___ *Timely and secure reporting?* ______________________

___ *Proactive suggestions to improve course?* ______________________

6. Contribution to the Team (*circle one*): ---> Exceeds Expectations Meets Exp. Does Not Meet Exp.

___ *Responsive (reachable; prompt replies)?* ______________________

___ *Rapport with instructor and fellow TAs?* ______________________

___ *Availability for unforeseen needs?* ______________________

___ *Leadership/support of fellow TAs?* ______________________

7. Continuing Development (*circle one*): ---> Exceeds Expectations Meets Exp. Does Not Meet Exp.

___ *Participation in TA seminar/events?* ______________________

___ *Observation of mentors?* ______________________

___ *Acting as mentor?* ______________________

Student evaluation of TA Physics Department, Oregon State University

TA NAME:______________________

PH CLASS_______________________

LAB_______RECITATION__________

DAY_______SECTION#_____________

1. What qualities of your TA do you regard as good or outstanding?

2. Are there areas in which your TA needs improvement? Please be specific. In particular, if you marked any item in the agree/disagree questions with a "disagree", please explain your reasons.

3. Do you have any other helpful comments about this TA's performance?

4. Do you have any other helpful comments how to improve the lab/recitation/studio?

Agree or Disagree Questions:

1. The lab/recitation/activity objectives and requirements were clearly presented to me.

2. The TA was well prepared.

3. The TA's speaking style was clear, audible and understandable.

4. The TA's explanations to the entire class helped me to understand the labss, recitations, or class activities.

5. The TA was effective in providing individual instruction and assistance.

6. The TA was enthusiastic about teaching physics/astronomy.

7. The TA was fair and impartial in dealing with me.

8. The TA encouraged me to think for myself.

9. The TA showed patience and willingness to help.

10. All things considered, I would recommend that a friend take a lab/recitation/studio from this TA.

11. I did enjoy the material presented in this lab/recitation/studio.

12. The TA used good interpersonal communication skills.

13. Overall, the TA was an effective instructor.

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
TA TRAINING & MENTOR PROGRAM

We would like to help you become a more effective teacher, and continue your professional development as a teacher throughout your graduate career. You will find faculty and graduate students friendly and informative on the topic, and do not hesitate to approach them for guidance at any time. However, we also have a more formal process in place that will connect you with mentors.

Opportunities to become a more skilled TA:

• *Physics TA training during Fall orientation week*
This is a discipline-specific orientation that gives you the tools you need to begin a successful teaching career. You'll meet faculty, experienced TAs, and discuss nuts and bolts, as well as new ideas in physics pedagogy.

• *OSU TA orientation during Fall orientation week*
More general discussions that include TAs from other departments.

• *The TA Seminar offered during Fall (required for first-time TAs)*
Discuss issues that arise during your first term; discuss items that are too detailed or premature for orientation week, continue to learn about physics pedagogy, practice presentations, specific training as needed. (See below for approximate schedule)

• *The Teaching Seminar offered during Winter and Spring:*
Discussion of special topics in pedagogy in physics and science. Very useful for those considering an academic career. Prior topics have included Physics Education Research, interactive teaching, conceptual reasoning, student attitudes, interdisciplinary issues in science education, effective pedagogical techniques, students' struggles with different representations in physics, TA training, grading.

• *Mentoring by experienced TAs:*
You will be placed in contact with an experienced TA, preferably one who has taught the class you are teaching. This person will attend some of your classes, offer feedback, and be available to help when you need it. You in turn will mentor incoming TAs as you gain experience.

• *Feedback and evaluation by course instructors & students*
Each term, students evaluate your performance. Faculty should observe some of your classes.

• *Apprenticeships*
Advanced teachers who have a strong motivation towards an academic career may apprentice with a faculty member (this can be done for credit), and take responsibility for a small part of the faculty member's class. This might mean preparing a few lectures, setting homework and possibly an exam question. The faculty member would discuss the course philosophy with you, and guide you through the process.

Continued on next page.....

DEPARTMENT OF PHYSICS, OREGON STATE UNIVERSITY
MENTOR PROGRAM REPORT & FEEDBACK

We would like to help you become a more effective teacher, and continue your professional development as a teacher throughout your graduate career. Part of the TA assignment will be to spend 4-5 hours per term involved in mentoring activities. In particular, this will develop the skills of the new TAs, but in the process, the professional development of the more experienced TAs will also be enhanced.

The particular activities should depend on where you feel you can be most effective, and the faculty, especially the course instructor, will be able to guide you. Examples include:

- receiving mentorship from other TAs
- attending the recitations or labs of other TAs and providing constructive feedback
- organizing and facilitating groups of TAs to discuss teaching and improve knowledge
- assisting with the Fall TA orientation and the Fall TA seminar
- helping compile literature for TA training
- other activities that can help TAs develop professionally

Normal preparation for your sections, if conducted with others, can be a mentoring activity, but please be very specific about how the mentorship role is demonstrated. Were you specifically working with first-time TAs? Were you and other TAs actively engaged in discussing lab strategy and how to manage the class?

Please help us enhance this program by answering the following questions. **This form should be returned by each TA to the course instructor each term.** Your comments will be held in confidence if you so request.

NAME: ______________________________
COURSE/TERM:_______________

1. What specific mentor activities did you engage in this term, and how many hours of your assignment did this responsibility take? (continue on reverse if necessary)

2. How were the activities beneficial to your professional development? To that of others? How did they enhance the program at OSU? How can the mentor program be more effective? (continue on reverse if necessary)

PROGRAM REQUIREMENTS FOR THE M.S. DEGREE IN THE DEPARTMENT OF PHYSICS

Each student who wishes to pursue the M.S. degree in physics will be advised by a member of the graduate faculty in the Physics Department. The faculty advisor will assist in planning a program appropriate for the student's needs and interests. For the M.S. degree, the Graduate School requires 45 credits with a 3.00 grade point average (minimum) and no grades below C on the program. Each student may choose a minor (approximately 2/3 of the credit in the major and the remaining 1/3 in a minor), which can be in Physics or another department. A minor outside the physics department requires that the student meet the minor requirements from that department and have a professor from the minor department on the examining committee.

The M.S. degree requires a Capstone experience, which can be satisfied by either the Thesis option or the Project option, as detailed below. No more than 50% of courses used for the M.S. graduate program of study may be the 500-level component of a dual-listed 4xx/5xx course.

Program Requirements

1. Completion of a minimum of 24 credits (Thesis option) or 30 credits (Project option) from the classes in Lists A, B, or C.
2. Completion of no more than 9 credits of "blanket" courses:
   PH 501 Research (only for Thesis option)
   PH 505 Reading and Conference
   PH 507 Seminars
3. Capstone requirement:
   A) Thesis option: Completion of PH 503 (Thesis, 6 credits minimum, 12 credits maximum) and completion of a M.S. Thesis. (See notes below concerning the thesis.)
   B) Project option: Completion of PH 501 (Research, 3 credits minimum, 6 credits maximum) and completion of a M.S. Project. (See notes below concerning the project.)
4. Each term, all students shall register for and attend the weekly departmental colloquium (PH 507, sec 1) presented by faculty members and visiting speakers on a wide range of topics of current interest.
5. Self-evaluation: Twice in the program (before the first program-of-study meeting and before the final oral examination) the advisor will write an evaluation of the student, and the student will write a self-evaluation. The evaluations are a list of things the student has done, with emphasis on what was done since the last annual meeting, to make progress towards the learning outcomes.
6. Training in the responsible conduct of research (details below), including the Research Seminar (PH 607-4 in Winter term of the first year).
7. Inclusion training: The core-advising committee will meet with students at the beginning of Year 1 to help students identify appropriate inclusion training.
8. The Graduate School requires a two-hour M.S. final oral examination on the major and minor subjects. This is ordinarily taken during the final term of study toward the M.S. degree. Not more than half of the examination period should be devoted to a presentation and defense of the thesis or presentation of the research project; the remaining time can be spent on questions relating to the student's knowledge of the major field, and minor field if one is included in the program.

List A: Physics core courses. MS students are required to pass at least 4 courses in this list from at least two different subjects with a grade C or better. Retaking a course should be discussed with the Core-Advising Committee. If a student retakes a course, the second grade will count (this is OSU's policy for retaking classes).The appropriate courses must be chosen in consultation with the student's advisor.

Dynamics	PH 621: Dynamics, 3 credits.
Statistical Thermophysics	PH 541: Capstone: Thermal and Statistical Physics, 3 credits.
	PH 641, 642: Statistical Thermophysics, 3 credits each.
Electromagnetic Theory	PH 531: Capstone: Electromagnetism, 3 credits.
	PH 631, 632: Electromagnetic Theory, 3 credits each.
Quantum Mechanics	PH 551: Capstone: Quantum Mechanics, 3 credits.
	PH 651, 652, 653: Quantum Mechanics, 3 credits each.
Mathematical Physics	PH 562: Mathematical Physics, 3 credits each.

List B: Other Physics courses

PH 511, 512: Electronics Laboratory, 3 credits each.
PH 515: Computer Interfacing, 3 credits.
PH 564: Scientific Computing II, 3 credits.
PH 575: Introduction Solid State Physics, 3 credits.
PH 581, 582, 583: Optics
PH 585: Atomic, Molecular, and Optical Physics, 3 credits.
PH 591: Biological Physics, 3 credits.
PH 555: Astrophysics, 3 credtis.
PH 595: Introduction Particle, Nuclear Physics, 3 credits.
PH 654: Advanced Quantum Theory, 3 credits.
PH 671/2/3: Solid State Physics, 3 credits each.
PH 681/2/3: Atomic, Molecular, & Optical, 3 credits each.

List C: Specialty courses with emphases in other subfields (materials science, computational physics, physics education, radiation and health physics). Courses from this list must be chosen with advisor approval; they should provide the student with a coherent degree. This list is not complete, other courses or other subfields (with approval) can be used. Note that some of these subfields can alternatively be studied within a minor program outside of physics.

Materials Science	CH 511, 512, 513, 540, 541, 542
Computational Physics:	CS 523, 561, 562, 575, 579, 582, ECE 572, 576
Physics Education:	SED 584
Radiation Physics:	CH 516, 518

Notes concerning the M.S. Thesis

The experimental, theoretical, or computational M.S. thesis is designed to be of limited scope, but of a useful character. Past theses have occasionally been accepted for publication. There are several steps that are designed to aid the student and the thesis advisor in reaching their common goal.

1. Upon arrival, each graduate student will be advised by the Graduate Program Director.

2. At the time of the choice of M.S. thesis option, the student will select a faculty member who agrees to be the thesis director, and who will also serve as the advisor. The student's committee is then selected (two additional faculty members plus a Graduate Council representative) by mutual consent of student and advisor, and at the first committee meeting, the student's program is formally approved and submitted to the Graduate School in accordance with Graduate School requirements. This procedure is normally completed by the end of the student's first year of graduate study.
3. When the feasibility of the thesis is established, the physics members of the committee shall meet to consider the proposal. If approved, this work shall constitute an acceptable M.S. thesis. A rough timetable should be established, for protection of both student and project advisor. It is strongly recommended that the thesis be completed by the end of the second year of graduate study.
4. The full committee will examine the student in a final oral exam, partly on the thesis and partly on general physics.
5. A favorable recommendation by the committee concerning the thesis and the examination will constitute satisfaction of the departmental requirements of the M.S. program.

Notes concerning the M.S. Project

The experimental, theoretical, or computational M.S. project is designed to give the student experience using the physics tools learned in the classroom. The project is necessarily of a limited scope, such that it can be completed by the end of the second year of graduate study. The general procedure describing the M.S. thesis given above applies here as well. It is the responsibility of the student to choose a project advisor. This should be done within the first year of graduate study. The full committee (advisor plus two other members) must approve the planned project. A clear timetable must be established, showing that the project can be completed by the end of the second year of graduate study. Projects building upon work done in a class, a term paper, or a senior thesis are acceptable. A report on the project must be submitted to the committee for its approval and a final oral exam is required. The report need not be submitted to the university (as is the case for the M.S. thesis). A report with approximately 3000-5000 words is considered to be sufficient.

Minimum credit requirement for graduate assistants:

Graduate students with full-time assistantships (teaching or research) are required by the Graduate School to take no fewer than 12 nor more than 16 credit hours per quarter. These credits need not all be in graduate level courses (500 and 600 level).

Training in the responsible conduct of research:

All graduate students are required to take training in the responsible conduct of research (RCR). In our department, RCR training has 3 parts:

- Online CITI training: see the OSU Responsible Conduct of Research Training page: http://research.oregonstate.edu/ori/responsible-conduct-research.
- Individual PI training: Principal Investigators will integrate Research Responsibility into their group activities.

- Modules in the Research Seminar (PH 607-4): Module 1, Module 2. The modules can be downloaded from http://www.physics.oregonstate.edu/research-ethics.

Graduate students need to complete the CITI training and the modules in their first year as part of the Research Seminar. Completion is documented by printing out the final results page from the CITI training and by attendance at the Research Seminar. Students who missed the research seminar should review the two modules and note that on the CITI printout. The printouts go to Kelly Carter in the Department office.

Inclusion and diversity training:

The core-advising committee will meet with students at the beginning of Year 1 to help students identify appropriate inclusion and diversity training. For example, it may be a course or workshop about inclusion and diversity. The student must participate in and pass the training.

Example Program

Below is an example program that satisfies the departmental course requirements over 6 quarters. Many variations are possible and are sometimes necessitated by the course schedules.

	Fall	**Winter**	**Spring**
1st year	PH 562 (3) PH 651 (3) Elective (3) PH 507-1 (1) Colloquium PH 507-3 (1) TA seminar PH 507-301 (1) SSO sem	PH 631 (3) PH 652 (3) Elective (3) PH 607-1 (1) Colloquium PH 607-4 (1) Intro Rsrch. PH 601 (1) Research	PH 632 (3) PH 653 (3) PH 575 or 585 (3) PH 607-1 (1) Colloquium PH 601 (2) Research
2nd year	PH 621 (3) PH 607-1 (1) Colloquium PH 607-301 (1) SSO sem PH 501 (7) Research	PH 507-1 (1) Colloquium PH 507-301 (1) SSO sem PH 501 (10) Research	PH 507-1 (1) Colloquium PH 507-4 (1) Comm Sem PH 501 (10) Research

Other notes

- An MS student with a GPA of 3.0 or more in 6 out of 9 core courses of the PhD program is eligible to be considered for transition to the PhD program. The student should write a letter to the Chair of the Physics Department to initiate the process. The letter should briefly describe the student's plan for PhD research and identify a potential PhD advisor. The admission to the PhD program is not automatic. The Grad Admission Committee makes the final decision on such requests.
- Undergraduate students wishing to complete a B.S. in physics and then an M.S. in physics within one additional year may do so via the Accelerated Master's Platform (AMP), which allows current OSU undergraduate students to take graduate classes and apply those credits to their current undergraduate degree and transfer them to a participating graduate program. Up to 15 credits of 500/600 level courses taken as an undergraduate can be reserved for use in a graduate program. These reserved credits

must be in addition to the undergraduate degree requirements and must be selected before (not after) taking the course. After receiving the B.S., the student must then enroll as a graduate student for the final year of this program and complete the remaining M.S. requirements.

For students choosing this AMP option, it is advisable to take one of the core course sequences during the last year of the B.S. Interested students should meet with the Undergraduate Program Director and the Graduate Program Director as soon as possible to discuss the details of this option.

- The Graduate School requires that the M.S. program of study be submitted 15 weeks before the final exam.
- A M.S. student in another department who wishes to obtain a minor in Physics must complete at least 15 credit hours of graduate courses. The student must consult with the head graduate advisor in Physics to determine the specific program.

PROGRAM REQUIREMENTS FOR THE Ph.D. DEGREE IN THE DEPARTMENT OF PHYSICS
(Adopted April 2020)

Requirements for advanced degrees are established by the University, the Graduate School, and the Physics Department. Broadly viewed, the requirements for the Ph.D. degree are (i) satisfactory completion of minimum course requirements, (ii) advancement to candidacy, and (iii) completion of a research thesis. The student's advisor should be consulted if there are questions or problems.

For the Ph.D. degree, the Graduate School requires 108 credits with a minimum 3.00 grade point average (GPA) and no grades below C on the program of study. The program must contain at least 36 thesis credits (PH 603) and no more than 15 credits of "blanket" courses (PH 601, PH 605, PH 607).

(i) Ph.D. Minimum Course Requirements

All candidates for the Ph.D. degree are required to take the following 9 core courses (27 credits):

PH 562	Mathematical Methods
PH 621	Dynamics
PH 631, 632	Electromagnetic Theory
PH 641, 642	Statistical Thermophysics
PH 651, 652, 653	Quantum Mechanics

These course requirements are to be completed in the first two or three years of the graduate student's program, depending on the advice and approval of the Core-Advising Committee.

The department requires a minimum OSU GPA of 3.00 in the core courses, which will be calculated from the highest 8 grades from the 9 core classes. Retaking a course should be discussed with the Core-Advising Committee. If a student retakes a course, the second attempt will count toward the student’s institutional credits (this is OSU’s policy for retaking classes).

All candidates for the Ph.D. degree must also take a minimum of 12 credits of advanced courses in order to acquire depth in their specialty area and breadth in one or more other areas. A coherent set of courses may be chosen from courses in the Physics Department or other departments as appropriate. Physics courses include but not limited to

PH 575	Introduction to Solid State Physics
PH 585	Atomic, Molecular, and Optical Physics
PH 591	Biological Physics
PH 555	Astrophysics
PH 581	Physical Optics
PH 582	Optical Electronic Systems
PH 595	Introduction to Particle and Nuclear Physics
PH 633	Electromagnetic Theory
PH 654	Advanced Quantum Theory
PH 671/2/3	Condensed Matter Physics
PH 681/2/3	Atomic/Molecular/Optical Physics

When a candidate needs to take advanced specialty courses outside of the Physics Department, the student and the major professor should select the courses with approval of the student's Program Committee.

Required seminars:

- All graduate students are required to register for and attend the Department Seminar (Colloquium, PH 607-1) each term.
- All graduate students are required to take the Seminar on Professional Communications for Physicists for one term (PH 607-4 in Spring term).
- First-year students are required to take the Research Seminar for one term (PH 607-4 in Winter term).
- Graduate Teaching Assistants are required to take the TA Seminar (PH 607-3) during Fall Term of their first year of study.

OSU GPA requirements:

A minimum grade point average (GPA) of 3.00 is required for all courses taken at OSU as a graduate student and for courses included in the graduate program. Grades on transfer courses will be included in the calculation of the program GPA, but will not affect the GPA of courses taken at OSU. You must meet the minimum GPA requirement before scheduling final oral exams.

Minimum credit requirement for graduate assistants:

Graduate students with full-time assistantships (teaching or research) are required by the Graduate School to take no fewer than 12 nor more than 16 credit hours per quarter. These credits need not all be in graduate level courses (500 and 600 level).

Training in the responsible conduct of research:

All graduate students are required to take training in the responsible conduct of research (RCR). In our department, RCR training has 3 parts:

- Online CITI training: see the OSU Responsible Conduct of Research Training page: http://research.oregonstate.edu/ori/responsible-conduct-research.
- Individual PI training: Principal Investigators will integrate Research Responsibility into their group activities.
- Modules in the Research Seminar (PH 607-4): Module 1, Module 2. The modules can be downloaded from http://www.physics.oregonstate.edu/research-ethics.

Graduate students need to complete the CITI training and the modules in their first year as part of the Research Seminar. Completion is documented by printing out the final results page from the CITI training and by attendance at the Research Seminar. Students who missed the research seminar should review the two modules and note that on the CITI printout. The printouts go to Kelly Carter in the Department office.

Pedagogical training:
The core-advising committee will meet with students at the beginning of Year 1 to help students identify appropriate pedagogical training. For example, It may be a course or workshop about being an effective teaching assistant in physics. The student must participate in and pass the training.

Inclusion and diversity training:
The core-advising committee will meet with students at the beginning of Year 1 to help students identify appropriate inclusion and diversity training. For example, it may be a course or workshop about inclusion and diversity. The student must participate in and pass the training.

Example Programs

The 9 core courses are regularly scheduled in an academic year as shown in the table.

Annual Core Course Schedule

Fall	Winter	Spring
Ph 562 MathM Ph 651 QM I Ph 621 CM	Ph 631 E&M I Ph 652 QM II Ph 641 SM I	Ph 632 E&M II Ph 653 QM III Ph 642 SM II

Below are example programs that satisfy the departmental course requirements over 6 quarters. Many variations are possible and are sometimes necessitated by the course schedules.

Example1: EM and QM in 1st year

	Fall	**Winter**	**Spring**
1st year	PH 562 (3) PH 651 (3) Pedagogy Training (3) PH 607-1 (1) Colloquium PH 607-3 (1) TA seminar PH 607-301 (1) SSO sem	PH 631 (3) PH 652 (3) Elective (3) PH 607-1 (1) Colloquium PH 607-4 (1) Intro Rsrch. PH 601 (1) Research	PH 632 (3) PH 653 (3) PH 575 or 585 (3) PH 607-1 (1) Colloquium PH 601 (2) Research
2nd year	PH 621 (3) Elective (3) PH 607-1 (1) Colloquium PH 607-301 (1) SSO sem PH 601 (4) Research	PH 641 (3) Elective (3) PH 607-1 (1) Colloquium PH 607-301 (1) SSO sem PH 601 (4) Research	PH 642 (3) PH 607-1 (1) Colloquium PH 607-4 (1) Comm Sem PH 601 (7) Research

Example2: EM in 2nd year

	Fall	**Winter**	**Spring**
1st year	PH 562 (3) PH 651 (3) Pedagogy Training (3) PH 607-1 (1) Colloquium PH 607-3 (1) TA seminar PH 607-301 (1) SSO sem	PH 652 (3) Elective1 (3) Elective2 (3) PH 607-1 (1) Colloquium PH 607-4 (1) Intro Rsrch. PH 601 (1) Research	PH 653 (3) PH 541 (3) PH 575 or 585 (3) PH 607-1 (1) Colloquium PH 601 (2) Research
2nd year	PH 621 (3) PH 531 (3) PH 607-1 (1) Colloquium PH 607-301 (1) SSO sem PH 601 (4) Research	PH 631 (3) PH 641 (3) PH 607-1 (1) Colloquium PH 607-301 (1) SSO sem PH 601 (4) Research	PH 632 (3) PH 642 (3) PH 607-1 (1) Colloquium PH 607-4 (1) Comm Sem PH 601 (7) Research

Example3: QM in 2nd year

	Fall	**Winter**	**Spring**
1st year	PH 562 (3) PH 531 (3) Pedagogy Training (3) PH 607-1 (1) Colloquium PH 607-3 (1) TA seminar PH 607-301 (1) SSO sem	PH 631 (3) PH 425 or 551 (3) Elective (3) PH 607-1 (1) Colloquium PH 607-4 (1) Intro Rsrch. PH 601 (1) Research	PH 632 (3) PH 541 (3) PH 575 or 585 (3) PH 607-1 (1) Colloquium PH 601 (2) Research
2nd year	PH651 (3) PH 621 (3) PH 607-1 (1) Colloquium PH 607-301 (1) SSO sem PH 601 (4) Research	PH 652 (3) PH 641 (3) PH 607-1 (1) Colloquium PH 607-301 (1) SSO sem PH 601 (4) Research	PH 653 (3) PH 642 (3) PH 607-1 (1) Colloquium PH 607-4 (1) Comm Sem PH 601 (4) Research

Once the course requirements have been satisfied, a typical program consists of a 12-credit combination of elective courses, seminars, and research or thesis depending on the student's research interests and guidance from the major professor and the committee.

Students are encouraged to begin exploring research opportunities during the first year of study and to engage in research as soon as possible, but in any case during the second year of study.

(ii) Advancement to Candidacy

In addition to the course requirements, the student must complete a writing project and pass the preliminary oral examination for advancement to candidacy. The writing project should be completed before scheduling the oral examination. The writing project and the oral examination are described in more detail in a separate document. It is the responsibility of each oral exam chair (usually the student's major professor) to describe the exam, and its possible outcomes, in detail to each examinee.

(iii) Completion of a Thesis

The Ph.D. is a research degree and a thesis on the research is required. During the first year of study, the student should make an effort to become informed about the fields of specialization offered in the department. These fields include experimental, theoretical, and computational studies in the areas of Atomic/Molecular/Optical Physics, Condensed Matter Physics, Biophysics, Physics Education Research, Astrophysics, and High Energy Physics. The seminar, "Introduction to Research," offered each Winter Term, begins this process. Other opportunities include specialty courses in various fields, visits to laboratories where work is in progress, specialized seminars, and the department colloquia at which a wide range of topics is discussed. Journals are available online via campus internet connections. It is also possible to do research with professors in other departments. For more information, see the head graduate advisor.

As early as possible the student should select a major professor, who will supervise the research leading to the thesis. Under the direction of the major professor, the student's program is planned beyond the core curriculum and a committee is set up to formally submit an approved program to the Graduate School. This same committee gives the preliminary oral examination for candidacy and evaluates the final oral examination.

There are six steps that are designed to aid progress toward the degree:

(1) As early as possible after the choice of major professor, a doctoral committee is selected to consider and approve the student's proposed program, and the program is submitted to the Graduate School. The student must file the program with the Graduate School before the end of the 5th term. This committee normally includes the major professor, another professor knowledgeable in the specialty field, two other physics faculty members, and an outside representative (GCR: Graduate Council Representative) appointed by the graduate school. All except the last are selected by mutual agreement among the major professor, the student, and the committee member. This committee also administers the required preliminary oral examination for admission to candidacy.

(2) As soon as a thesis problem has been selected and the first preliminary results obtained, the student presents an outline of the scope, background, and purpose of the research to the program committee at the preliminary oral examination. This should constitute a proposal of what is to be done for the thesis research. It is the Committee's responsibility to pass on the suitability of the proposal, so that if it is done as planned, it would comprise an acceptable thesis project. This step is designed to clarify, for all concerned, exactly what is expected. It is not intended to be restrictive; if a new line of interesting work appears in the course of the project, the committee would be expected to be hospitable to a suggestion for a change of plans. Once the initial plan is approved, the student is to file a thesis title with the Graduate School. (This title can be changed by petition as often as necessary.)

(3) Every year, the student is to report to the program committee on the progress of the thesis research. The preliminary oral exam and the final oral exam count as annual meetings. The advisor writes an evaluation of the student, and the student writes a self-evaluation. The evaluations are a list of things the student has done, with emphasis on what was done since the last annual meeting, to make progress towards the learning

outcomes. The committee reviews the evaluation letters before the annual meeting. The student must document the meeting by filling out a scheduling form available in the Physics office, which will be placed in the file. The major professor is responsible for placing the evaluation letters and a signed report document in the student's file recording the committee's discussion with the student about the work and the proposed timelines.

(4) When the written thesis is ready, the full committee (including the graduate representative) is called together for the thesis defense and approval of the thesis in final form. Questions about any areas of physics may be asked at this examination at the discretion of the committee.

(5) The departmental thesis requirement shall be considered fulfilled when:
  (a) The full committee has approved the thesis (see previous paragraph) and
  (b) The student has met the publication requirement approved by the program committee.

(6) The student shall give the department three paper copies. The department will bind these copies, one will be returned to the student, one kept in the departmental archives, and one will be given to the major professor.

(iv) Minor Requirements

There is no formal minor requirement for the Ph.D. (Physics major), but every candidate will be expected to have a satisfactory background in mathematics and a broad knowledge of physics beyond the area of the specialty. Preparation in these areas will be evaluated in (a) the preliminary and (b) the final oral examinations.

A Ph.D. student in another department who wishes to obtain a minor in Physics must complete at least 18 credit hours of graduate courses. The student must consult with the head graduate advisor in Physics to determine the specific program.

“Satisfactory Progress” for Graduate Students in Physics

Accepted 28 January, 2010

Graduate students are expected to make satisfactory progress towards their degrees. The OSU Graduate Catalog states that a student may be dismissed from the Graduate School for “…failing to make satisfactory progress toward an academic degree as determined by a major department or the Graduate School.” These guidelines define satisfactory progress towards a graduate degree in Physics. Students with questions about satisfactory progress should contact the Major Professor, the departmental Head Graduate Adviser, or the Department Chair.

Students will be notified in writing of these progress guidelines at the beginning of their first term of enrollment. If concerns arise as to whether a student is progressing satisfactorily, these concerns will be communicated to the Graduate Student and discussed among the Major Professor, the departmental Head Graduate Adviser, and the Department Chair in an effort to resolve problems and assist the student.

Exceptions to the guidelines must be explicitly justified and will be granted only with approval of the Department Chair, who will log the approved exceptions in the student’s file. Failure to resolve cases of unsatisfactory progress will lead to suspension or reduction of financial support, or dismissal.

Decisions about reappointment as a teaching assistant for students who are making satisfactory academic progress are based on evaluations of their performance as a teaching assistant.

The PhD Program in Physics defines satisfactory progress as:

- Identifying a Major Professor, forming a Graduate Committee, and submitting an approved, signed Program of Study form to the Graduate School prior to the end of the fifth term of enrollment.
- Commencing research under the direction of the Major Professor prior to the end of the fifth term of enrollment.
- Satisfactorily completing required courses within the first three years of enrollment – course requirements are described in detail on the physics department website http://physics.oregonstate.edu/phdProgram.
- A grade-point average of 3.00 (a "B" average) is required: 1) for all courses taken as a degree-seeking graduate student, and 2) for courses included in the graduate degree or graduate certificate program of study. Grades below "C" (2.00) can not be used on a graduate program of study. A grade-point average of 3.00 is required before the final oral or written exam may be undertaken.
- Entering candidacy for the Ph.D. degree by passing the written Comprehensive Examination and the Preliminary Oral Examination prior to the end of the third year of enrollment.
- Initiating and participating in annual meetings with the Graduate Committee at which a written and an oral progress report is presented by the Candidate, discussed with the Graduate Committee, and accepted by the Graduate Committee as a demonstration of satisfactory progress.
- Acting in a timely manner to bring serious conflict between Student and the Major Professor to the attention of the Graduate Committee, the Head Adviser, or the Department Chair. In such cases, the parties involved will work in accordance with policies documented elsewhere.
- Completing a Thesis based on research performed as a graduate student and obtaining approval from the Major Professor and Graduate Committee prior to the end of the sixth year of enrollment.

- Successfully defending the Thesis and passing the final oral examination prior to the end of the sixth year of enrollment.

The Graduate Committee will have primary responsibility for monitoring the progress of the Graduate Student. The Graduate Committee will meet annually with the Graduate Student at which time the Graduate Student will present a progress report. The Graduate Committee will evaluate the Graduate Student's progress toward the degree and discuss their assessment with the Graduate Student. A report summarizing the Graduate Committee's assessment will be added to the Graduate Student's file after each such meeting.

First year students who have not yet formed a Graduate Committee will meet with the Head Graduate Adviser in spring term.

The MS Program in Physics defines satisfactory progress as:

- Identifying a Major Professor, forming a Graduate Committee, and submitting an approved, signed Program of Study form to the Graduate School prior to the end of the second term of enrollment.
- Deciding whether the degree will include a Master's Thesis or a Project (non-thesis option) prior to the end of the second term of enrollment.
- Commencing thesis or project research prior to the end of the third term of enrollment.
- Satisfactorily completing required courses within the first two years of enrollment – course requirements are described in detail on the physics department website, http://physics.oregonstate.edu/msProgram.
- A grade-point average of 3.00 (a "B" average) is required: 1) for all courses taken as a degree-seeking graduate student, and 2) for courses included in the graduate degree or graduate certificate program of study. Grades below "C" (2.00) can not be used on a graduate program of study. A grade-point average of 3.00 is required before the final oral or written exam may be undertaken.
- Participating in a progress meeting with the Graduate Committee during the fourth term of enrollment.
- Acting in a timely manner to bring serious conflict between student and the adviser to the attention of the attention of the Graduate Committee, the Head Adviser, or the Department Chair. In such cases, the parties involved will work in accordance with policies documented elsewhere.
- Completing a Thesis or written Project Report based on research performed as a graduate student and obtaining approval from the Major Professor and Graduate Committee prior to the end of the second year of enrollment.
- Presenting a report on the Project or successfully defending the Thesis and passing the final oral examination prior to the end of the second year of enrollment.

The Graduate Committee will have primary responsibility for monitoring the progress of the Graduate Student. The Graduate Committee will meet with the Graduate Student at the beginning of the second year of enrollment at which time the Graduate Student will present a progress report. The Graduate Committee will evaluate the Graduate Student's progress toward the degree and discuss their assessment with the Graduate Student. A report summarizing the Graduate Committee's assessment will be added to the Graduate Student's file after the meeting.

In the event that graduate study extends beyond two years, the committee and the student will meet at the beginning of the third year to develop a plan for timely completion of the degree.