Graduate Student Expectations & Information

This description of expectations is intended to ensure that we have a clear understanding of what we expect from one another, and to provide resources that may help in career planning. I am in a University position because I enjoy teaching people how to do science by engaging in real research projects with them, and helping them to develop a professional approach to scientific research. Many students begin their work with a thesis advisor without a clear idea of what to expect, and without a clear idea of what it takes to succeed in a graduate program. This document is intended to provide a clear framework for our professional interaction. Read this and discuss any questions, issues, or suggested changes. Remember that our professional relationship is a two-way interaction, and you should inform me of your hopes and goals in undertaking a project as well. Reading this should make you feel that you are embarking upon a challenging experience. It should not make you feel that I am unreasonable and rigid, and should not make you feel that this challenge will be a miserable experience!

Goals

Your reasons for entering our graduate program might include a desire to discover whether you like research enough to pursue a career in academia or government, to enter employment in private industry, or to pursue other objectives such as gaining physical science experience as a basis for a law degree, etc. Regardless of your exact reason(s), your major goal should be learning how to be a professional scientist, and my major role as a mentor is to help you learn how to develop into a professional scientist.

I will provide advice and direction on your research project, including direction in choosing and designing a thesis topic, researching the background information, planning and conducting field and/or laboratory analyses, writing and revising proposals, abstracts, and publishable manuscripts, and giving professional presentations. *I select and design (and/or guide you in selecting/designing) research projects with the intent that the results will be sufficiently new and important to merit publication*, and I have selected you as a student because of your talents and promise. Seeing a project through to publication requires *enormous* commitment and self-discipline, and will typically require significant work extending beyond the formal duration of your appointment. I will freely provide help, advice and suggestions; but you have the ultimate responsibility for completing your thesis satisfactorily.

I will expect to write letters of recommendation for you, upon your request. I will want to write as positive and honest a letter as possible, so keep me aware of your successes, and help me to find good things to say about you! Let me help you fix areas in which you are not successful, and develop a professional attitude that keeps any insecurities in their proper place. You can trust me to write a letter of recommendation for you that describes your skills and ability as positively and honestly as possible. If you want me to write that you consistently do more than I expect, then make that effort; i.e., impress me.

Time Commitments and Project Milestones

The time commitment to research is an absolutely key issue for graduate students and mentors. **I expect you to construct and share with me a project timeline with specific**

goals at least once per year, and to meet these deadlines. I will attempt to bolster your progress and your written and oral skills by requiring regular presentations of your work in lab group meetings, a prelim and thesis proposal, and periodic meetings. You should let me know if problems arise in the course of meeting deadlines and expectations, such that we can find a mutually acceptable solution. Just as I am imposing demands on your time, you have a right to my time as well, in terms of mentoring you in your project progress. Accordingly, we will have periodic meetings to review progress and discuss any issues or concerns. In addition to these, feel free to contact me anytime you need to discuss something- email works, but often it is most efficient to simply stop by my office.

Most people struggle with time management issues, which is why I share my views here. I expect you to regard graduate school as at least a full-time job. Downtime for mental refueling is certainly necessary, but I expect the typical "good" graduate student to work hard, which may require weekends and evenings. This is the standard expectation for any good student in any decent program, and I impose the same demands on myself. I assume that a minimum workweek for a graduate student is 45 hours. Consider that 8-9 credit hours of (non-research) coursework require around 20 hours per week. A Teaching Assistantship (TA) requires 10-15+ hours per week. Research will require a minimum of 10 to >25 hours per week; **clearly, however, all of these numbers will shift and evolve depending on your stage in the program.** For example, as a beginning graduate student, your available time will be largely expended in non-project coursework and TA responsibilities, and your time available for research will be correspondingly less. As you progress through the program, your non-thesis coursework will diminish, and you should spend the majority of your time on research.

If you are on a Research Assistantship (RA) or fellowship (and thus funded by grant or School money), you should be spending >20 hours/week on research (during the school year), and full time if it is during the summer. Furthermore, if I am funding you on a RA, your duties may include both work related to your own thesis project **and** research tasks that I assign. Remember that a RA or TA-ship is a paid job, the funding that you are receiving is not easy to secure, and you should undertake the duties and commitments inherent to this job with a high degree of integrity and responsibility.

Use your time wisely, and enjoy your free time immensely. Non-work-related email, the New York Times, Pong? Whatever it is, banish it from your *working* hours. Know when you are working and when you are playing and stay productive, happy and healthy by consciously making the most of both sets of time.

As a graduate student, you'll need to take responsibility for knowing when various university forms are due, securing the requisite signatures, and so forth. A good place to start is on the ESS website:
http://www.ess.washington.edu/ess/education/grad/guide.html.
Some major milestones that you should keep in mind include the following:

Target milestones (very generalized):

All Students:

• Year 1 – coursework; select research topic and 1st year committee members; conduct

exploratory research and data analysis; begin literature review for research proposal; apply for research grants; present at group meeting, take Qualifying or “Prelim” Exam

PhD Students:

• Year 2 – write thesis proposal, defend proposal to committee, construct timeline and review with me, apply for student research grants, begin data collection
• Year 3 - update and review timeline, hold committee meetings for update, consider abstract submission / professional meeting presentation, complete data collection and analysis, begin outlining and drafting manuscript for first thesis chapters
• Year 4 – draft of 2nd chapter; submit manuscript(s) for publication, hold committee meetings, take General Exam if it wasn’t taken in Year 3
• Year 5 – draft of 3rd and possibly additional thesis chapters; submit manuscript(s) for publication; hold committee meetings, complete thesis draft; defend; depart graduate school for gainful employment!

Masters Students:

• Year 2 (Fall) – construct timeline and review with me, continue data collection and analysis, coursework; present progress in lab meeting (with committee present); consider abstract submission / professional meeting presentation; apply for research grants
• Year 2 (Winter/Spring) – update and review timeline, coursework, data collection and analysis, begin outlining and drafting project manuscript
• Year 2 (Summer) – finish data collection and analysis; begin thesis draft
• Year 3 (Fall) – Complete and revise thesis paper draft; defend, submit manuscript for publication, depart graduate school for gainful employment!

Time to degree: ~2.5 years (Masters), ~5 years (Ph.D.). It will go fast.

If your goal is indeed gainful employment at the end of all this work, your efforts should focus on the things that will help you in this regard: (1) developing skill as a professional scientist, writer, and speaker, (2) earning glowing letters of recommendation/references from me and other faculty or professionals with whom you interact, (3) strengthening your CV to reflect appropriate preparation for the job you seek (*curriculum vitae*: an extended resume highlighting your experience, published abstracts and papers. For an example of an academic CV, see mine at http://faculty.washington.edu/kate1/CV.html)

Intellectual Property, Authorship, Writing

Plan to publish the results of your research in a peer-reviewed outlet. There are two important reasons for this – one that’s important to you, and one that’s important to me:

(1) You will spend significant effort on your project, and it is a wonderful feeling to see that effort translate into a high-quality publication that will benefit the scientific community, contribute to your personal CV, and make your advisor proud! If your work appears only in your thesis, it will collect dust in the university library. (Test this by inserting a $20 bill into the library copy of your thesis, and checking back in 20 years to reclaim your cash). Further, there is no better way to learn scientific thinking and writing than to write a manuscript, and receive reviews from experts in the field. Accordingly, I require all my students to write their thesis as a series of manuscripts targeted for

submission to peer-reviewed journals or equivalent (e.g. special publication). You should plan to submit a manuscript about the time you graduate (this might be the first manuscript for a masters student, and the 3rd or 4th for a PhD student), *which means that revision and resubmission will continue for a time beyond your formal commitment in the graduate program*.

(2) A great deal of time and money (typically $50-100K per year) are invested in your thesis research, and this requires follow-through with publication of results. One reason is very practical: I must demonstrate results from funded research, or funding agencies will deny future funding. Furthermore, research is expensive, and someone – whether taxpayers (all of us), private corporations/donors, or scientific societies – commonly helps us pay for it. Hence, it is incumbent upon us to demonstrate appreciation for these funds via publication. Papers resulting directly from your thesis work are yours, and you will likely (and preferably) be first author on them. If I (and/or others) have a substantial role in producing the idea, designing the project, and/or writing the manuscript (which is the case for nearly all thesis work), then I (and/or others) will be a co-author. First authorship means that you have performed the majority of the intellectual and physical effort, completed the project, and *conducted the majority of the writing*. If you cannot complete your work in a timely fashion, you forfeit your right to be first author.

Writing well is a key skill that you should develop and hone during graduate school. I will help you with your writing by requiring multiple drafts of outlines, proposals, abstracts and manuscripts, and providing you with prodigious feedback on these drafts. I teach ESS 418, *Geoscience Communication*, and share the best tips in our group meetings. I strive to be constructive in my comments; if, however, you ever feel put off by something, please let me know… sometimes carpal tunnel keeps my comments terse and I don't do enough to commend the good work.

Professionalism

Part of your higher education includes developing or honing skills of "professionalism". Professionalism includes (1) taking responsibility for one's own actions and duties, (2) maintaining reasonable respect for and tolerance of other views, (3) a willingness to make reasonable compromises to meet shared goals, (4) a pleasant demeanor (genuine or projected), (5) a focus on accomplishing tasks as expeditiously as possible, and (6) an ability to escape, avoid, or ignore petty arguments and gossip. You should also strive to project a professional demeanor in appropriate circumstances (e.g. mock or professional presentations, interviews, etc.). Note that a professional relationship does not require friendship, but should allow you to work reasonably well even with people you personally detest, or who detest you (although we all hope it never comes to that!).

A professional manner carries us through periods of disagreement and difficulty with minimal stress. It allows one to become displeased or angry with another, yet avoid furious denunciation and accusation. It should allow one to calmly consider a situation and discuss it with others involved as a problem to be solved. It should allow one to invite and accept reasonable criticism as constructive rather than destructive. As a mentor, I expect to offer honest judgments about professional abilities, and to ignore issues that are irrelevant from a professional view (e.g., political or religious views).

Professional Enrichment

You should take every opportunity for professional enrichment during your graduate-school tenure, as long as it does not keep you from progressing towards the successful completion of your thesis and other duties. Some ideas for both networking and non-traditional learning:

• Professional Societies

Most professional societies offer great deals for student membership. Member fees are minimal, and you receive perks such as journal publications and meeting registration discounts. Some that you should consider joining include the American Geophysical Union (www.agu.org), Geochemical Society (http://www.geochemsoc.org/), Geological Society of America (www.geosociety.org), and Mineralogical Society of America (http://www.minsocam.org/). Check their websites for information on meetings, student grant opportunities, publications, etc. Don't forget internet listservs and societies as well, for example, the Gilbert Club (geomorphology http://calm.geo.berkeley.edu/geomorph//gilbert.htm) and the Earth Science Women's Network if you are a woman (http://www.sage. wisc.edu/eswn/).

• Professional Meetings and Workshops

Attending the national (or sectional/regional) meetings of professional societies is a fantastic opportunity for networking and developing interview and presentation skills, in addition to learning cutting-edge science. Each student should strive to present results of his/her research at a professional meeting at least once before departing graduate school. I will always do my best to help locate funding to enable you to attend a meeting at which you are presenting research I have supervised; in return, I expect you to do your best to be as reasonable as possible in expenses (e.g. choosing economical lodging, sharing hotel rooms, seeking good airfares, etc.). There are also many opportunities for travel grants, and reduced registration fees for fieldtrips and short courses, and ESS is supportive of student attendance. Other sources for aid include the University and professional societies. Always plan well in advance, since many travel grant applications have early deadlines. If you are considering an academic career near the end of your time in grad school, I recommend the NSF-supported "On the Cutting Edge: Professional Development for Geoscience Faculty" preparing for an academic career workshop and online resources (http://serc.carleton.edu/NAGTWorkshops/index.html).

• Student Research Grants

Many of the professional societies offer student grants-in-aid of research, and I will strongly encourage you to apply for these, especially if other funding is unavailable. Preparing these grant applications provides a great opportunity for you to clarify your project in your own head, hone persuasive writing skills, and critically consider the resources you need to conduct the research. Awards also look great on your CV, and proposal-writing skills will serve you extremely well in many future jobs. The GSA, AAPG, SEPM, Sigma Xi, Evolving Earth and the like regularly host student grant competitions, and many of the regional sections do as well. ESS also holds an annual student grant competition, and you should apply each year. Furthermore, students can

(and should) apply for the competitive NSF Graduate Fellowship.

• Internships

We academics will teach you academia, but internships teach you about industry employment. And you can bet they'll pay you more than a paltry salary and the contents of the lab cookie jar. Accordingly, you might consider participating in an internship during your schooling, if scheduling and your desires allow. Keep in mind that some companies now hire for full-time positions from their intern pools, which means that internships could be critical for your future employment opportunities. I suggest attending info sessions and signing up for an informational interview with on-campus recruiters from ExxonMobil or other resource companies to broader your perspective (and to make you eligible for various scholarships!).

• Seminar Attendance

We have a weekly colloquium (Thursdays, 3:30 pm) to which we invite off-campus speakers to present their research and expertise. **I expect you to attend the colloquium!** Attendance bolsters student-student and student-faculty camaraderie, offers the opportunity to learn something new. I view students who regularly attend colloquium as "good" students (as opposed to apathetic ones), and I want all of mine to be good! At its best, the colloquium exposes you to new ideas and good camaraderie; at its worst, you learn how NOT to give a presentation. Despite having personally suffered through many a dreary colloquium, I still expect you to attend as often as possible.

• Other Opportunities

Other opportunities you should be aware of include occasional seminars, workshops, and fieldtrips that crop up periodically here on campus and/or nearby. Keep your eyes out and participate as often as possible. If you are interested in a career in education, taking advantage of outreach opportunities (e.g., through the ESS departmental outreach group "Rockin' Out") or mentoring undergraduates can be a rewarding experience that also bolsters your CV.

Rewards

Research is hard work, and you need to be largely self-motivated. There are, however, rewards—both tangible and intangible. The tangible rewards include such "perks" as pay (albeit modest) for doing something you enjoy and that is related to your chosen field, as well as buttressing your resume/CV with a TA or RA position and all publications (abstracts, papers) that represent the formal fruits of your labor. Publications are absolutely critical for any student who thinks s/he might be interested in an ultimate position in academia. Traveling to meetings to present something new is another enjoyable by-product of research, as is travel for fieldwork or lab work (usually!). Also, you can request letters of recommendation from me at any time, and I will do my very best to highlight your strengths in the most positive light. Intangibles include the intellectual reward of discovering something new! I hope you enjoy your research experience, and learn from it.

General Lab Rules

You may access the lab at any time for research, quiet study space, computer use (including email), or research work requiring the lab (equipment or meeting space). Please obtain instructions before using any equipment. You are welcome to take over one of the drawers that is not already in use – please place your name on the drawer. Be respectful in use of lab space and equipment. **Keep work areas clean**, and compartmentalize your workspace—do not monopolize large areas. Respect others' workspaces as well. This applies to computer space and usage as well. Do not put extraneous items (programs, personal files, and especially no music/video files, etc.) on the computers. Please keep all of your files in a folder with your name on it in the "User Data" folder. Regularly back up the lab computers using the attached external hard drives, and **back up your personal computer and all data completely at least once per month, preferably once per week**. Please do not loan out your lab key or remove any equipment from the lab without consent from me. If a piece of equipment needs attention, let me know. Despite all of our best efforts at keeping the lab reasonably organized, it will need cleaning and organization now and then, so we'll hold a lab cleaning "party" every so often during one of the weekly group meetings.

Note Taking and Research Notebook

Note taking is a critical skill that you should take seriously. You would never dream of making observations or having thoughts in the field or lab without recording them in your field or lab book, so don't waste your efforts searching and reading the literature, plotting data, or working on a Matlab code by failing to take careful notes on what you are doing. All students must keep a research notebook. It doesn't have to be pretty (take a look at one of my notebooks!). Date every entry. Staple loose papers and plots into the notebook at the end of each day. Bring your notebook and your planner to every meeting so you can (1) update me on your progress and questions, (2) take notes on our discussions, and (3) record the list of deliverables for our subsequent meeting so we can refer back to it next time. Recording your work in one place keeps you efficient, helps us communicate, and makes your hard work and accomplishments tangible! If you'd rather blog or keep a comprehensive electronic notebook, I'm open to suggestions….

Weekly Group Meetings

My research group holds a weekly group meeting (register for ESS 595, Research Methods) at a time when all students are able to attend. These meetings are extremely important for our research group, and so I ask you to make every effort to attend all of them. The objectives of these meetings are several: (1) to give me a chance to hear how you are progressing; (2) to provide an opportunity for students to discuss any issues/problems; (3) to give students ample opportunity to make presentations during their tenure as graduate students; (4) to allow us to build on our knowledge of group and outside cutting-edge research; (5) to build a sense of community within our lab group and related faculty and students in ESS. I hope that you find them as useful as I do.

Safety

Ask before attempting anything that might cause you or others harm. Be sure you know

the rules before handling any type of chemical (in various states—liquids, gases, etc.), and apprise me of what you are dealing with so that we both know the procedures. When performing fieldwork, you should let me know your plans and whereabouts and have a field assistant if at all possible; I will try to recruit others to help you in the field if you are having trouble securing an assistant. Please practice common-sense safety such as always wearing seat belts, taking a phone with you, maintaining a healthy respect for wildlife, and not eating the moldy yak jerky or climbing the cliff with the death grass growing on it. If you get hurt in the field when I am not there, TELL ME. Don't worry that I will worry; it's my job. I will not get mad at you, and I might even be able to help.

Resources

Take an active role in planning your career by investigating guides and resources compiled for students. I've posted several resources on my webpage at: http://faculty.washington.edu/kate1/Resources.html. In addition to these links, other internet sources offer some places to start:

- The National Academies (http://nationalacademies.org/careerguides.html) has links to online versions of its several useful publications dealing with career planning, mentoring, ethics, women in science, etc.
- The American Association for the Advancement of Science (http://www.aaas.org/careercenter/)
- The National Association of Colleges and Employers (http://www.naceweb.org/).

Also check the professional society web pages that are immediately relevant to your work.

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