

Ellner research group guidelines and expectations

General

My goals as an advisor are to encourage high standards, independence, and a supportive attitude towards peers. From my advisor, Simon Levin, I learned by example that treating science as a team sport (with only one team) is more fun and ultimately more productive than “playing to win”. I try to be both supportive and demanding, in terms of course preparation, level of effort, and quality of work. You should tackle important questions and be eager to work hard to acquire new skills and get results. It won’t be fun all the time, but it should be rewarding enough to make up for the times that aren’t fun.

The research group is inclusive. The ethnicity, religion (or lack of), sexual/gender orientation, political beliefs, etc., of group members should be immaterial. We all have abilities and disabilities, some more evident than others.

Everything coming out of the group needs to get my prior approval (“out” in this regard generally means that it’s going off-campus): meeting abstracts and presentations, grant proposals, manuscripts submitted for publication (and often the computer scripts that go with them). Often I’ll say “just do it”, other times I will want to see the product before it goes out.

Getting Help

The “DIY PhD” approach in E&EB and Applied Math, in which you select and develop your own projects, gives you the freedom to operate as an independent scientist. But to succeed, you need to make good use of the available help, including but not limited to the advice and help that I can give you. I and other faculty are your intellectual guard rails and safety net. I usually schedule a 1-hour time slot each week for a one-on-one meeting with each student. But I might not identify what problems you’re encountering, or even recognize that there is a problem, and I’m really, really bad at picking up on hints. When all else fails (or before), just tell me there’s a problem.

You should also be aware of the many campus-level programs for support of graduate students (see gradschool.cornell.edu/student-experience/help-and-support). These are staffed by experienced experts; whatever your issues are, they’ve seen it before and they probably have better advice than I do. It can be very helpful just to get the validation that the issues that you’re facing are ones that others have faced before, and to hear that others have dealt with them successfully.

Degree Progress and Expectations

For consistency, all of my students follow the E&EB timeline, which you can find at www.eeb.cornell.edu/Ellner/EEBGradReqs.pdf (Applied Math students can ignore the first paragraph). My students generally spend much of their first two years on coursework, and take their “A” exams in their third year, preferably in the fall semester. You should form your thesis committee by the end of your third semester, if possible, to leave two full semesters (spring of year 2, fall of year 3) for any courses that committee members might want you to take before your “A” exam. After the “A” exam you can still take courses, but generally at most one per semester because your focus is on research.

My “A” exam questions are generally limited to your graduate coursework and topics relevant to your thesis research. E&EB has stated intentions of formulating field-wide guidelines for “A” exam content and expectations, but they are not yet in place.

At any time, you should have a clear idea of what your next goals are, and your timeline for reaching them. Whenever you feel that this is not the case, ask me about it. Please keep me informed about all professional activities you are involved in (grants, seminar invitations, outreach, etc.), and especially about “side projects” that you are considering.

I hesitate to say anything quantitative about “level of effort” – how many hours you should devote to classes and research. But being a PhD student is more than a full-time job, and finishing your thesis is likely to require more concentrated effort than you’ve ever put into anything else. For some period of time, generally a substantial portion of your final year, to finish your thesis by your target date you will have to prioritize it above everything else put together, and aim to make some progress on your thesis *every day of every week*. That’s not a rule I’m making for my students (or planning to enforce) – it’s just fair warning about how things usually work out when you’ve accepted a job or postdoc and need to finish in time so you can start on time.

Thesis and Publications

A PhD thesis generally consists of three first-authored papers suitable for a high quality peer-reviewed journal, or equivalent work packaged into two large papers. Some students do closely related papers, others do several distinct projects. It’s good to start publishing early, so you have refereed publications on your CV when you search for a job or postdoc, but it isn’t always possible because intermeshed projects sometimes finish up at all once right before the thesis defense.

I believe in being generous about manuscript authorship. Anybody who carried out some of the work gets listed as a co-author. For somebody making less direct contributions (advice, discussions, help with a lab protocol or some tricky coding, etc.), I generally ask them whether or not they want to be a co-author. In my experience, you can trust people to give a reasonable answer. *The cost for adding a marginally deserving co-author is much lower than the cost for excluding somebody who ends up feeling slighted*. However, I don’t consider it automatic that any paper based on one of your thesis chapters will include me as a co-author. Current standards for co-authorship should be applied to me in the same way that you apply them to everybody else, to determine if my name belongs on the title page or in the Acknowledgements section. On average, I have been a coauthor on $1.36 \pm 0.84(\text{sd})$ papers per PhD student that I have advised or co-advised.

Professional development

For many of us the “core” professional societies are (on one side) ESA (Ecological or Entomological Society of America), ASN (American Society of Naturalists), and on the other SIAM (Society for Industrial and Applied Mathematics) and SMB (Society for Mathematical Biology). I maintain membership in all of those, and I suggest that you join at least one “on each side” (not necessarily those I belong to) to start engaging with your future professional peers.

As soon as you have research results, you should start giving presentations either on campus or at professional meetings. I suggest that you attend a major professional meeting (such as one of the ESAs) at least twice as a grad student – as soon as you can give a contributed talk about your work, and again when you’re actively networking for your first postdoc or job. Going more often won’t hurt, if you can get the funding. ASN and SMB annual meetings, and the SIAM Conferences on Life Sciences or on Applied Dynamical Systems, are also worth considering if they would be an appropriate venue for presenting your research. If you’re presenting at a meeting, you can apply for a travel grant from the Grad School once each fiscal year (which starts some time over the summer).

The E&EB and Applied Math weekly seminars are valuable resources for keeping abreast of your field. E&EB would like to see us every week at the E&EB seminar. Applied Math would like to see us every week at the Applied Math seminar. Most weeks I go to at least one of them, but usually not both. I advise you to do something like that, but I'm not taking attendance. I do expect you to attend the weekly EcoTheory journal club whenever you can (when it's running), and to take an active role in leading discussions.

The Graduate School offers a plethora of workshops and programs on various aspects of professional development; see gradschool.cornell.edu/academic-progress/pathways-to-success. It's worth browsing to see what's available, especially the offerings from the Center for the Integration of Research, Teaching, and Learning (CIRTL). There are programs out there you might not expect, such as support groups for students having trouble with writing their theses, and they can be very helpful.

Grant applications are typically part of life for E&EB students, but less so for students doing theoretical work. I have no standard for how many applications a student should make before graduating, and I do not encourage applying for the sake of applying – if you don't need the money, you have better things to do with your time.