

IS GRADUATE SCHOOL FOR YOU?

Graduate school is a big decision. Done right it is a chance to delve deeply into something you really like. Done wrong it can lead to frustration and disappointment. This is all about how to make a good choice. The first decision about graduate school is not deciding where to go. We'll call it *Deciding Why to Go*. Graduate education, while it is a continuation of your undergraduate studies, is not the same as the undergraduate experience. The classes are much more intensive and expect more out of the student in terms of both background knowledge and efforts in the classroom. Consider the following questions and how they apply to you:

- Are you willing and able to let graduate school be a major component of your life?
- Will you be able to crank things up a notch and work harder?
- Are you ready to put off "real-world money" for a little bit longer?
- Do you have a good, real reason for furthering your education or are you doing this to avoid the working world for a little bit longer?



We follow *Why with Deciding What Degree You Wish to Get*. If you have already made up your mind about your next diploma, you can skip this section. For our purposes, there are three types of graduate degrees, the PhD, the Master's, and the Professional Master's.

The PhD is just what you think. After a few more years study, you choose a field you'd like to specialize in, pick an advisor to help you, and then do some research. Ok, maybe a lot of research. Then you produce a dissertation, defend it, and get to call yourself "Doctor". There is a lot of hard work, qualifying exams, and other requirements involved in this, but it can lead to a career doing something you are passionate about and that can't be beat.

A Master's degree is similar in nature to a PhD, but is less intense. There are no qualifying exams to take and rather than a dissertation, a project of some significance or an exam is required.

It used to be said that "Graduate school is training in research." This may have fit in the past, but it no longer true with the coming of the Professional Master's. Considered the equivalent of a business school's MBA, a Professional Master's degree is usually earned while the student is out working and usually has a second discipline (e.g. operations research, biology, economics) attached to it. For more information on this degree, go to the website for the National Professional Science Master's Association (www.npsma.org).

Next is *The Search for Where To Go*. There are lots of opinions on that. Some say you should never go to graduate school at your undergraduate institution. Others say that is ok because you're at a place that knows you. Some people say go for the money - whoever offers you the largest stipend, wins. Still more say, look at the reputation of the school. Here is some good low-down: If you have an area you know you like, find a school specializing in that. If you do not know what subject sounds best to you, find a school whose graduates have varied dissertation topics. How do you find out which school has varied top-

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ics? The best way is to ask, ask, ask. Every person in your department with a Master's or PhD went through graduate school and can help. Your school should also have a copy of a publication called *Fellowships and Assistantships in the Mathematical Sciences*. This book, put out every year, lists graduate schools by state, tells how many teaching/research assistantships it gave out last year, what they paid, and how many PhD's the school produced in various topics over the past five years. So if you really love real analysis, yet the school you were thinking of lists only one PhD in that, it is not the school for you.

Once you have your long list, put the internet to good use and look up the departments you are interested in. Of course everyone puts their best face forward on their web page, still you can learn something. Look for seminars. You want the school to have several. This shows the faculty are active in their fields. You should see if the site lists current research papers published by faculty. Don't worry if you don't understand the titles of the talks and papers. Ask a professor for help making sure the de-

partment does what you want. Look at the size of the departments. If you are used to a small department and a close relationship with faculty, you may end up uncomfortable as one of over a hundred graduate students at a large university. Women may wish to concentrate on how many women faculty



members and graduate students there are.

If possible, *Try to Visit Campuses*. During these visits you can look around the school and see things for yourself. Make sure to chat with some current graduate students. Many graduate schools can help you with the expenses if you've been accepted and offered support, but check with them first. In person, you can see the facilities and see for yourself how content the graduate students are. Even if you have yet to be accepted, you can still find things out. With the internet you can see the university from the comfort of your own room. You can send an

email to graduate advisors asking them to put you in touch with a graduate student so you can ask him/her questions about the student life there. What questions should you ask? Here are some:

- Is the typical stipend enough to live on in the area?
- Do TA's teach classes or run recitations'?
- How much and what kind of support is in place for TA's?
- How are the classes there? What does everyone take?
- How competitive are the students? (laid back student + competitive school = bad fit)
- How long have you been working on your degree?
- What's the average time to PhD?
- What are the student offices like? Crowded? Noisy?
- What can you tell me about the qualifying exams? Other exams?
- What do students do for fun/relaxation?
- How long do you get in-state tuition?

If you cannot make it to campus, and if you already know a professor that you would like to work with at the school, find a student

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working with that professor and email that person to ask about that professor as an advisor. Also, emailing a first-year graduate student may give you some insight on the transition to being at that school.

Now the *Applications Process* rears its head. Applications for graduate school are usually due in December or January, but don't wait until the deadline is near to start filling these out. Get an early start, the earlier the better. If you are applying to schools that want your GRE (Graduate Record Exam) scores, make plans to take those early and get them out of the way. Study for the GRE math subject exam. Don't assume since you've had the classes you can just skim your books and take the test. Look around, your current school may run a study group, or you can help start one.

A bit here about *What You Do and Don't Know*. Every math student takes a calculus sequence. We all have differential equations, linear algebra, real variables, and abstract algebra, but after that things get a little murkier. Maybe you decided to forego complex analysis for combinatorics

or your undergraduate school never offered topology and now you're wondering if that going to hurt you. The short answer is no. The longer answer is there are way too many classes out there for anyone to know everything. If there's some undergraduate class you didn't take and your graduate school wants you to have it, then you can take it when you get there and no harm done. If you think too much has leaked out of your brain and you cannot recall enough, then I have the book for you. Thomas Garrity of Williams College has published a book entitled *All the Mathematics You Missed: But Need to Know for Graduate School*. You can get it in paperback from Barnes and Noble (or elsewhere) for about \$30, definitely a good deal.

The old saying is *A journey of a thousand miles begins with but a single step*. The same is true with finding and applying and deciding and starting graduate school. If you put some work into making sure the early steps are done properly, then you are headed for a very enjoyable journey that will pay off long after you are done with your education.

