Advice-for-Doctoral-Students (backup of old website)

Studying at the CUNY Graduate Center:
The department has two sets of blackboards where students can work together: 4214 and 4217. Remember some students are working hard on the computers nearby, so work together quietly. Feel free to ask senior students and faculty questions about anything related to mathematics classes or your course of study. Just remember that if a student or professor is concentrating intensely, don't distract them until you see them look up. Appointments can be made to meet with faculty by email. It is often best to ask questions about teaching from faculty at the campus where you are teaching since each campus of CUNY has different rules and expectations of their students and instructors. When asking mathematical questions, it is often best to ask for a recommended textbook so you have an accurate resource to consult later.

Graduate Courses and Textbooks
It is important to do significant reading outside of class when taking a graduate course. Generally there are a few standard textbooks in each field and it makes sense to do all the homework in them as you take the corresponding graduate course (not just the problems the professor assigns). You should also try to decifer your notes after each meeting but remember notes are not guaranteed to be correct and you should check up statements of theorems in textbooks and study the proofs there. Examples are as important as theorems so don't neglect them either.

It is good to find a group of students to study with, but be wary that some students will "explain" things they know nothing about. So be sure to be discussing specific theorems and lemmas with a textbook handy. Be sure not to be over eager to explain things yourself. It is also important to familiarize yourself with the faculty in the department. We have quite a few older students and visitors around. It is best to seek out a faculty member when you are really stuck on a question. It is alright to ask someone if you can have their name and write it down so you can look them up later.

As you discover an interest in some fields more than others it is important to speak to a faculty member in the area for advise. Our faculty are listed by research area here. You can email to ask advise about which written qualifying exams to take and what books to master for those exams. It doesn't hurt to get advise from a few faculty members and if you find one particularly accessible they may be someone you'd like to check in with more often.

Remember the focus of your attention in the first year of graduate school is preparation for the first exams and faculty can be consulted with help in this direction. Do not start reading articles and doing research until you have proven your background is thoroughly understood with three passed exams.

Preparing for the First Exam (written qualifiers)
Once you've chosen which qualifying exams you plan to take, you need to master the material. You can get the syllabi and sample examshere. However, you should only print out the syllabus and get advise about some suggested textbooks to master. You should do all the problems in the textbook and check them over with a faculty member or older student. Working together can be helpful too but try to find someone at your ability level who doesn't tell you all the answers or ask you for too much help.
Save the sample exams to do in an exam setting! When you think you are prepared for the exam, take a sample exam in a timed situation. Then study up what you've missed and repeat. You should not be learning the material by doing the practice exams. Textbooks are organized and their problems are just as hard but in a setting where you can learn from them. Just imagine the calculus student that tries to study

for the calc final by taking practice calc finals instead of doing a few homework problems from each section. Remember: if you just took the course and weren't mastering a text at the same time, you probably don't know the material.

At many universities, students must pass their first exams within one year, with September as an opportunity for a retake. These are universities where students finish in five years. Depending on your background, you may need to take more than a year to finish all three exams but keep in mind that these are the first exams and there is a lot more work to be done after they are completed. Students planning to switch into finance should take real analysis.

The focus of all your attention before passing the first exams should be the first exams, not seminars, not reading articles, not special topics courses, not language courses.

Language Examinations:
Do not waste time on language courses!!! To learn a language you really only need to read a textbook or survey article in that language. Be sure to read something for which you already know the mathematics and all you'll be doing is figuring out the math. For many students, the required level of proficiency can be achieved with 2-3 weeks of intensive focus on the language and this is a good way to spend a winter break.

Seminars:
GC Seminars
Arrange your schedule so that you are at the GC on the same day as your field of interest's seminar. This way the faculty and students you are more likely to work with will be around.
All graduate students who have completed the written qualifiers should be attending one seminar or more a week. Look up keywords in the abstracts before attending. Try to follow for the first 15 minutes or more and then feel free to discretely do homework.
Nearby universities:
Columbia
NYU
Check out their courses and unofficially audit classes if the prof allows.
Check out their seminars and conferences!

Mathscinet
mathscinet has reviews of every math article with links to related articles
Check out our faculty's research before choosing an advisor.
Try full searches with key words from your thesis.
It also has a useful formatting to help with creating the bibliography of your paper (bib).

Choosing Advisors:
When the written quals are done you need to choose a field, find an advisor and master the textbooks recommended by that advisor. Together you will write a plan for your second examination which is an oral exam. If possible work with two advisor either both officially or one in a less official status who can still advise you on the same research topic. It can also be helpful to have a mentor for more personal concerns distinct from the advisor.

Do not delay. It is better to choose too soon and switch advisors than to linger without one for too long. You can also mention to a faculty member that you are looking for an advisor and that you'd like some advise about the field and who to work with. You can consult the list of faculty organized by field and also

the list of faculty with grants. Many faculty have detailed webpages including preprints and talks. You can google their names to see what comes up and check them out on mathscinet.

Look up their students at the math genealogy. An older professor with many prior students can provide you with academic brothers and sisters that can support your career and help you find jobs. Younger faculty members may have academic siblings of their own who will help you. Of course you should choose an advisor who is actively engaged in research and giving talks. A few of our faculty are exceptionally well known and are well worth building a positive relationship with whether they become your advisors or just write one of your letters of recommendation when you graduate.

If a faculty member seems relucatant to take you as a student, ask if there is some way you could convince them by reading a specific book and demonstrating the knowledge. Some advisors are willing to train students in their subfield with a few independant study courses while others prefer students who have already mastered the basic texts. Some advisors prefer to meet with their students at an undergraduate campus and you may arrange to teach at that campus to make this more convenient. It is also quite common to communicate with an advisor frequently by email. It is perfectly acceptable to email a member of the department that you have never met before and arrange to meet with him or her to discuss advising or any other question you may have. You might even discover you do know this faculty member and never realised it!

Working with an Advisor:
Be honest with your advisor. Ask him or her what textbooks you are expected to know and then admit if you have not studied the book thoroughly yet. It is not productive to let your advisor give you articles to read that you have no hope of reading. Meanwhile, an advisor can be helpful when you are still studying texts and you can ask them questions about the problems you are trying and show him or her the problems you think are correct as well.

Ask your advisor worthwhile questions that exhibit independance. Do not go to your advisor or another faculty member to ask for the definition of some term. This should be looked up yourself in a math dictionary or even on wikipedia. You can go and ask about the intuition behind some definition after demonstrating that you know what you are talking about by writing the definition on the board.
Follow your advisor's advise and don't start your own side projects like reading an article that interests you without checking with the advisor first. Finishing a doctorate is a fulltime job that takes years, side projects that are unrelated to your research or future jobs will only delay things.

Make regular appointments to see your advisor and have clear goals as to what must be accomplished between meetings. Do not avoid your advisor because you aren't keeping up with the work. Keep seeing him or her regularly perhaps with smaller monthly goals. The doctorate is your degree and the goals and meetings are for you to pursue.

Meetings and conferences:
AMS information
Check out the mathematics calandar in the above website. Many conferences have funding for graduate students to attend and it can be an opportunity to see what is going on in your field.
Check out special sessions at nearby sectionals. Submit abstracts of your completed results when your advisor says you are ready.

Research Articles

Ordinarily one doesn't read research articles until one has an advisor who is recommending one that is at your level. Generally, that means after you have passed the related written qualifying exams and mastered a few textbooks in your area of study.

The Mathematics ArXiV has eprints of research articles which usually appear a year or two before publication. This is an easy free resource to use from home with an excellent search engine. Beware the authors are not seperated out carefully as they are on mathscinet.

For published articles, check the author's webpage or just google the title, before bothering to go to the library. In addition to the CUNY library, there is the New York Public Library on 34th and Madison which has extensive on reserve holdings. Courant and Columbia have their own math libraries.

Your own research:
Advice on starting research can best come from your advisor and it is important to choose a research topic that your advisor knows very well and can guide you through. It is essential to be sure that you are working on an original project and not something which has been done before. An advisor can guide you through this.

It is becoming increasingly common to write a short paper and publish it before completing your dissertation and graduating. This can help you with your job hunt. The first paper might be written with your advisor (coauthored or not) or with a different professor if your advisor approves. It is usually shorter than a thesis and more guidance may be given than for your thesis. When the professor helping you write it agrees that the paper is ready for submission, you may post it on the arxiv and submit it to an appropriate journal. If your advisor agrees, this paper might form part of your thesis or it may not.

Your thesis:
Advice on writing your thesis can only come from your advisor.
There's a document class file which can be used for the PhD dissertation. Instructions on its use are included as comments in the file.

A guide to latex. Also don't forget that mathscinet has the bib formats for all articles to make bibliography creation easier.

The job search:
AMS Website on Careers has advise and listings.

The best way to get a job is to finish most of your thesis the summer before graduating and start applying in October with a paper approved by your advisor already posted on the arxiv. You will need a letter from your advisor stating that you have done enough work to graduate. Then you defend in May after finding a job. If you don't find a job the first year you try, you may decide not to defend and repeat the job hunt before graduating. Or you may defend but fail to meet some other requirement to graduate to pospone the PhD by a year.

To land a tenure track job at a four year college, one usually needs to complete a research postdoc at a university first. This often means leaving New York City for a couple of years. It is possible to find a postdoc near enough to come home every weekend, although some graduates find excellent postdocs around the world. One way to obtain a postdoc is to apply for funding directly from the National Science Foundation, or a comparible institution in your home country. These deadlines can be as early as October 1 and you may need to take some time the summer before graduation emailing possible postdoc advisors

who will write letters of support promising to work with you. You have a better chance of getting such an award if the postdoc advisor is very well known.

It is standard to send well over 60 applications when doing a job hunt. Email professors in your field everywhere you apply to make sure they see your application and know you'd be interested in working with them will improve your chances considerably. Be prepared to spend significant time the Fall before you graduate on the job hunt and prepare to spend the Spring before that finalizing your thesis.
Let me know if you have any questions.

This is an old page from before 2010.

Christina Sormani