

Grad School

Should I go and how do I go about it?
October 15, 2014

What Jobs Require Grad School?

- University teaching/research (Ph.D.)
- Government labs (Ph.D.)
- Community college or private high school (MS)
- Stockroom personnel or instrumentation manager (BS, MS or Ph.D. – depends on position)
- Industrial research and development
 - Need Ph.D. to advance to managerial levels
 - Group leader, etc.
 - BS or MS for research assistant or technician
 - MS will lead to higher salaries for jobs similar to BS level jobs
 - MS will have better promotion prospects than BS
- Lots of ideas on ACS web page:
<http://www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers.html>

Undergraduate Preparation

- Research!
 - School year and/or Summer
 - ACS-SA webinar on Summer research **next Tuesday, 5:50pm!**
- Take as many advanced classes as possible
- Take advantage of opportunities such as tutoring to build teaching skills (and enhance your own understanding)
- Develop writing, literature reading and searching, and presentation skills
 - Take seminar seriously
 - Read and act on lab report feedback
 - Present your research on posters and orally at conferences
- Get good grades
 - GPA *at least* 3.0 for Ph.D. programs
- Consider a minor or courses in other subjects
 - Math, Physics, Bio, Languages, Computers

MS vs. Ph.D vs. ??

- Most students do Ph.D. directly
 - Requires in depth research and thesis
 - Average of ~5 years
 - Combination of classes (1-2 years), research, thesis
- MS good if weaker undergrad background
 - Average ~2 years
 - Requires less in-depth research and shorter thesis
 - Also if you change your mind about what you want to do
- Professional Science Masters programs
 - Based on course work + internship
 - Usually no formal thesis or research
 - Appropriate if already employed in industry or for advanced preparation for a very specific field
- Other types of program
 - MD/Ph.D., M.Ed., etc.

Choosing Schools and Specialization

- Academic Interests
- **Schools with *several* research groups of interest**
- Different requirements at different schools
- “Special” programs
 - Teaching prep
 - Combinations of fields – biophysics, chemical biology, astrochemistry, materials, polymers
- Location
 - Good opportunity to get away
- Facilities
- OK to get a job for a few years and then go back to school
- Search online and/or use DGR: <http://dgr.rints.com>

Application Requirements

- Fees?
 - Check to see if waived
 - \$30 (EIU), \$75 Umich (waived), \$90 Berkeley
- Timeline – next slide
- Essays – topics on later slide
- GRE (General (online) \$195, Subject (paper) \$150)
 - General offered year round
 - Subject offered September, October and April
 - Get sent directly to schools (4 schools free, then \$27)
- Transcript – get sent directly or upload pdf (check each school)
- Reference letters – get sent directly (usually online now)
- GPA
- External funding sources
 - NSF fellowships and others

Essay Topics

Example from U. Michigan:

Research Statement: Upload your Research Statement online in place of the "Statement of Purpose." The Research Statement should be a maximum of three pages and must include:

Research experience: State the goals of your research and a one paragraph summary of each of your research projects, highlighting your contributions. Please include a list of publications or presentations of this research (do not send us the actual publications).

Clearly indicate area of research interest (analytical, organic, chemical biology, inorganic, physical, or materials).

List a minimum of three U-M faculty whose research interests you.

Personal Statement: This statement may be used to determine your suitability for specific fellowships. Your personal statement should enhance our understanding of your personal background and life experiences, including educational, cultural, familial, or other opportunities or challenges (500 words maximum).

Dates and Deadlines for Fall 2015

- Spring 2014:
 - Think about what areas of chemistry interest you most
 - Think about what areas of the country you want or do not want to be in
 - Search online for schools with research groups that interest you
- Summer 2014:
 - Email or phone schools for information
 - Begin to narrow down general subject areas and schools
- August – September 2014:
 - Sign up for and take General GRE (and subject, if necessary)
 - Finalize list of 3-8 schools
 - Make list of deadlines and admission requirements
- September – October 2014:
 - Make general requests for reference letters
 - Send list of schools and deadlines to referees

Dates and Deadlines for Fall 2015

- October – November 2014:
 - Draft and revise personal statement and other essays
 - Submit electronic requests for references
- Mid-November 2014:
 - Begin submitting actual application materials
- December:
 - Finish submitting application materials
 - Check that all reference letters and transcripts have been received
 - Follow up with faculty writing letters, if necessary
- January – March:
 - Receive decisions and visit schools
- April:
 - Make final decision about where to go

The GRE!

- <https://www.ets.org/gre/>
- General test
 - 2 Math sections (35 min each, 20 questions each)
 - 2 Verbal sections (30 min each, 20 questions each)
 - 2 Writing sections (30 min each, analyze an “issue” and an “argument”)
- Subject test
 - Whether or not to take it?
- Preparation for both
 - Lots of free materials online:
https://www.ets.org/gre/revised_general/prepare?WT.ac=grehome_greprepare_b_130807
 - Do several practice tests and then work on specific areas that you’re weak in
- Register online:
https://www.ets.org/gre/revised_general/register?WT.ac=grehome_greregister_b_130807
- Scope out the test center ahead of time and allow plenty of time to get there and find a place to park
 - Champaign, Springfield, ...
- Be prepared to be treated like a criminal!

After You're Accepted

- Visiting
 - Many schools will pay for you to visit!
- Talk to both students and faculty
 - Does faculty do publishable research?
 - Do they have funding? Enough to support students?
 - Do they have tenure?
 - What are they like as an advisor? Hands on or hands off?
 - How long do their students take to graduate?
 - Are they accepting new students?
- Find out whether you're being offered a TA or fellowship or research assistantship
- Does the school require or offer research rotations?
- Does the school offer paid pre-entrance Summer research
- Changing groups and/or schools and/or changing your mind?

What to Expect

- <http://www.lsa.umich.edu/chem/graduate/pathwaytoaphd> - U. Michigan summary of Ph.D. program
- http://chem.berkeley.edu/grad_info/degree_programs.php - U. Berkeley summary of Ph.D. program
- <http://www.eiu.edu/eiuchemgrad/courses.php> - EIU summary of MS program

Once you get there

- How to pay – should have a TA but may need to pay fees
 - Won't get paid until end of first 4-6 weeks!
- Entrance/placement exams – often written by ACS
 - To place you in appropriate level courses, remedial UG work if needed
- Cumulative exams – required by some schools/divisions but not others
 - Usually ~5 of these must be passed in first 2 years
 - May be one area or all areas of chemistry
- Candidacy exams – usually end of 2nd year
 - Some sort of research proposal and/or oral exam
 - May be directly or indirectly related to your research
- Choosing a research group – already talked about this...
- Getting acclimated at an R1 school
 - Normal to be overwhelmed at first
 - Fewer classes but much harder and more other commitments (teaching, etc.)
- Research and Classes
- Thesis and defense
 - Often some sort of pre-thesis or “data” meeting
 - Defense usually involves public seminar and closed-door oral exam
- Stay in touch with someone at EIU
 - What do you wish you'd seen or known before you left?
 - What did you get at EIU that put you ahead of other students?

After Grad School

- Postdoctoral fellowship
 - Necessary for academic career
 - A few Ph.D. graduates get academic jobs directly
- Visiting Assistant Professor positions
 - Get real teaching experience beyond TA
 - More and more necessary for getting a good academic position
- Industrial position
- It is possible to switch between academic and industrial positions

Links

- <http://www.acs.org/content/acs/en/careers/college-to-career/areas-of-chemistry.html> - areas of chemistry
- <http://www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers.html> - chemistry careers
- <http://www.acs.org/content/acs/en/careers/college-to-career/next-steps.html> - College to career next steps
- <http://dgr.rints.com> - DGR
- <http://www.acs.org/content/acs/en/careers/college-to-career/next-steps/further-your-education.html> - ACS grad school info page (tons of stuff)
- <http://www.acs.org/content/dam/acsorg/education/students/graduate/planning-for-graduate-work-in-chemistry.pdf> - PDF with everything you always wanted to know about grad school in chemistry
- <http://www.acs.org/content/acs/en/education/students/graduate/gradschool.html> - more general page of grad school resources
- <https://www.ets.org/gre/> - GRE page