

Is Graduate School for you?

What are the important questions and reasons?

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EXCELLENCE

Graduate Education: What are the questions?

- **Why go to graduate school?**
- What degree? Masters or Doctorate?
- Where should one go? And how to choose?
- When is the right time for grad school?
- What about preparing a good application?
- How can the cost of grad school be covered?
- What is the typical graduate school experience?
- Who do I talk to for my questions?

Why go to Graduate School?

- Approximately 1/3 of your adult life will be spent at work, 1/3 sleeping, and 1/3 “living”:
 - ➔ The number one reason to go to graduate school is so that you can do what you really want to do, because so much of your life IS work.
 - ➔ And part of a life well-lived can be a life spent doing what you really want to do.

What are the top three reasons to go to Graduate School?

1. Doing what you really want to do is immensely rewarding.
2. Graduate degrees in science and engineering lead to (on average) roughly \$500,000 more income over a lifetime – this number is not really quantifiable for individuals, just the aggregate.
3. Graduate degrees enable upward mobility AND lateral mobility.

What are reasons 4 thru 8 to go to Graduate School?

4. Graduate school exposes you to the frontier of your field, you become a true expert in your discipline.
5. Graduate school ties together (i) curricular expertise with (ii) basic research and (iii) industrial applications. Those “big picture” connections are hard to make in any other way – which is why so many fail to appreciate the importance of basic research and advanced degrees.
6. Graduate school is an excellent way to “re-tool” in a tough or changing economy.
7. Graduate school opens new career possibilities that many students had never considered.
8. **Research and Teaching Assistantships**: Many graduate programs in science and engineering pay you to go to school, salary, plus tuition and fees (in part or in full, depends on the program).

So, why go to Graduate School?

The **NUMBER 1 REASON** is because part of a life well-lived can be a life spent doing what you really want to do.

- When your work is something that you enjoy, life is enormously more satisfying.
- When your work is something that you enjoy, you are generally far more productive for yourself and for society as a whole.
- When your work is something that you enjoy, you are not only happier with yourself, but that happiness often positively “rubs off” on others in your life.

What degree?

Masters, Doctorate, Both?

- What influence should your career ambitions have on the degree that you pursue?
 - Leadership positions in research, or professorships in academia, generally require a Ph.D.
 - Research positions in industry or government typically require a thesis Masters degree
 - Leadership (non research) positions in industry or government, and instructorships in academia, typically require an Masters (w/ or w/o research)

Masters, Doctorate, or both?

- Turning the question around, what influence does a M.S. and/or Ph.D. have on career options?
 - An M.S. enables both advancement and leadership roles in industry and government. It also enables research positions in industry and government, as well as instructor-level academic positions.
 - BUT, an M.S. sometimes inhibits entry-level positions in industry and government (i.e. – “over-qualified”).
 - A Ph.D. enables higher-level research and leadership roles in industry and government. It also enables professor-level positions in academia.
 - BUT, a Ph.D. sometimes inhibits lower-level positions.

Masters, Doctorate, or both?

- If you are after a Ph.D. does it matter if you earn an M.S. prior to applying, or enroute to the Ph.D.?
 - This tends to depend on the discipline, and the size of the school:
 - Many engineering programs either require or strongly prefer doctoral applicants to have an M.S., first.
 - Many science programs are indifferent to whether doctoral applicants have a M.S., or not.
 - Larger, research-intensive universities tend to be indifferent to whether you earn a M.S. prior to applying to a doctoral program.
 - Many of the larger, research-intensive universities award a non-thesis M.S. enroute to completion of the Ph.D.

What is the difference between:

- i) a thesis Masters degree (usually) M.S. and**
- ii) a non-thesis Masters (M.S., M.Eng., P.S.M., etc.)?**

- A thesis Masters degree is a research-driven degree.
 - Setting aside the distribution of credits, the central accomplishment and education of a student pursuing a thesis degree is completion of their research,
 - Coursework for a thesis degree, in contrast, serves to provide Masters-level foundation and position the student to do research.

- A non-thesis Masters degree is a coursework-driven degree:
 - The central accomplishment and education of a student pursuing a non-thesis degree is completion of their foundational and specialized advanced courses.
 - Some, but not all, non-thesis M.S. degrees require a small research project (much less than a thesis), primarily to give such students some sense of the research endeavor.

Where should one pursue an M.S. or Ph.D.?

- Does it matter if your graduate degree(s) come from the same institution as your undergraduate degree? Two arguments, different conclusions:
 - Attending different institutions often expose the student to a broader range of academics, research, culture, faculty, and students.
 - This is the most commonly-held view in academia.
 - Attending the same institution often exposes students to a deeper connection with faculty, students and a particular academic area.
 - This option is particularly attractive for BS/MS or Accelerated MS programs. This option is also very attractive for students who are place-bound (for reasons of family, two-career couples, etc.)

How does one choose a Graduate School?

Personal Reasons - always!

- First, it is important to define **YOUR** objectives: discipline, level of degree, intended career trajectory, etc. – because all else hinges in these decisions.
- Next, what graduate school criteria are most important to **you**?
 - National ranking?
 - Strength in your particular interests?
 - Personal interaction with the faculty?
 - Funding (RAs or TAs)?
- Sources of info: (i) Faculty of your current college or university, (ii) fellow students, (iii) U.S. News & World Report, (iv) REU experiences.

Where? – additional considerations:

- How should one choose an institution?
 - Accelerated MS (or BS/MS) speeds up completion of MS degrees and reduces cost,
 - For students that may require some distance delivery, the availability of such delivery,
 - Region of the nation,
 - If you visit the institution, do the other graduate students seem happy with their graduate program?
 - Other personal reasons (to a region, institution, etc.)

When should one go to graduate school?

- Should I delay? Many larger employers will pay your tuition and fees, after you have worked for them for “X” years, and usually with a commitment from you to continue working for them for “Y” years.
- Or should I go right away? In the case where you know exactly what you want to do, and that requires an advanced degree, why wait?

How does one prepare for Graduate School in STEM?

How does one prepare a good application?

- Get involved with research at your current college or university.
- If your field is engineering or physical science, take plenty of mathematics beyond ordinary differential equations – such as PDEs, Prob & Stats, Numerical/Computational methods, etc.
- When the option exists in a dual-level class, take the graduate level.

How can the cost of Graduate School be covered?

- Two key things to consider:
 - First, federally-back undergrad loans can be deferred while you attend graduate school; with no payments and no interest while you are a graduate student.
 - Second, in STEM, most programs will provide a stipend (salary) and some or full coverage of tuition and fees; which means that you should not have to incur any further debt while in graduate school.

What is the graduate school experience?

How is graduate school different from undergraduate?

➤ Pace:

- Just as undergraduate education goes at a pace 2-3 times faster than high school education, so too does graduate education proceed at a pace 2-3 times faster than undergraduate education.

➤ Rigor, Depth and Specialization:

- The subject-matter depth is much greater, the standards by which one is held is much higher, and the curricula are much more focused and specialized (**there are no “gen eds” in graduate school**, and students generally do not take courses outside their discipline).

➤ Freedom, Self-discipline and Self-sufficiency:

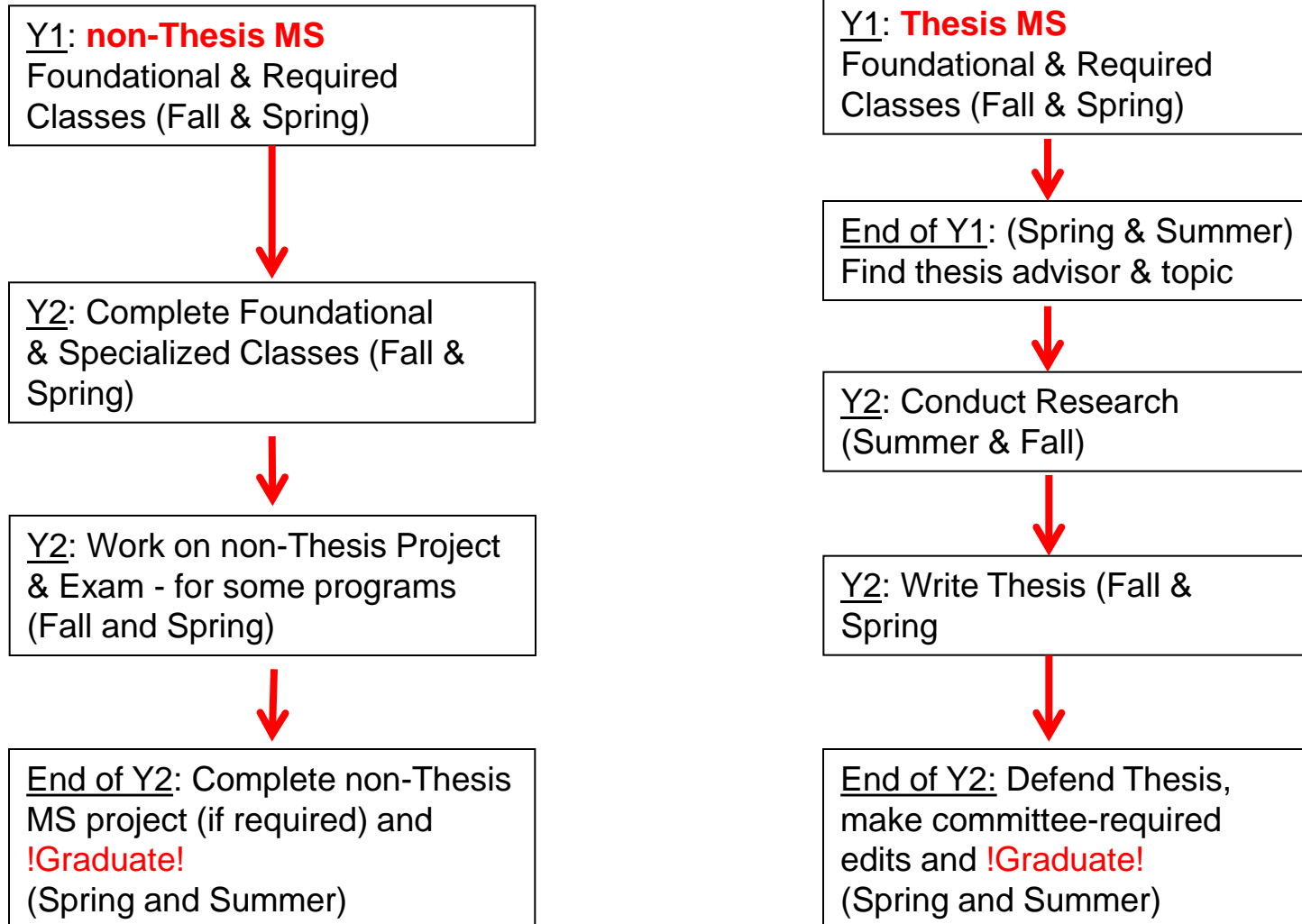
- Graduate students have considerable freedom to construct a specialized program of study and research topic, graduate students are expected to do most of their learning and discovery outside the classroom, and **graduate students are expected to emerge as intellectual leaders in their discipline.**

How long does it take to complete a graduate degree in science or engineering?

- National Averages, compiled by the U.S. National Science Foundation, are:
 - M.S. \approx 2 years , starting with a B.S. and no prior graduate work,
 - Ph.D. \approx 5 years, starting with a M.S. (or 7 years, starting with a B.S., and no prior graduate work)
- Caveats:
 - These are national averages over fully-funded, partially-funded and unfunded research-focused degrees,
 - My experience is that students that take control of their education can complete their Ph.D. in approximately 5 years, post B.S.,
 - My experience with M.S. students, however, is consistent with the national average.

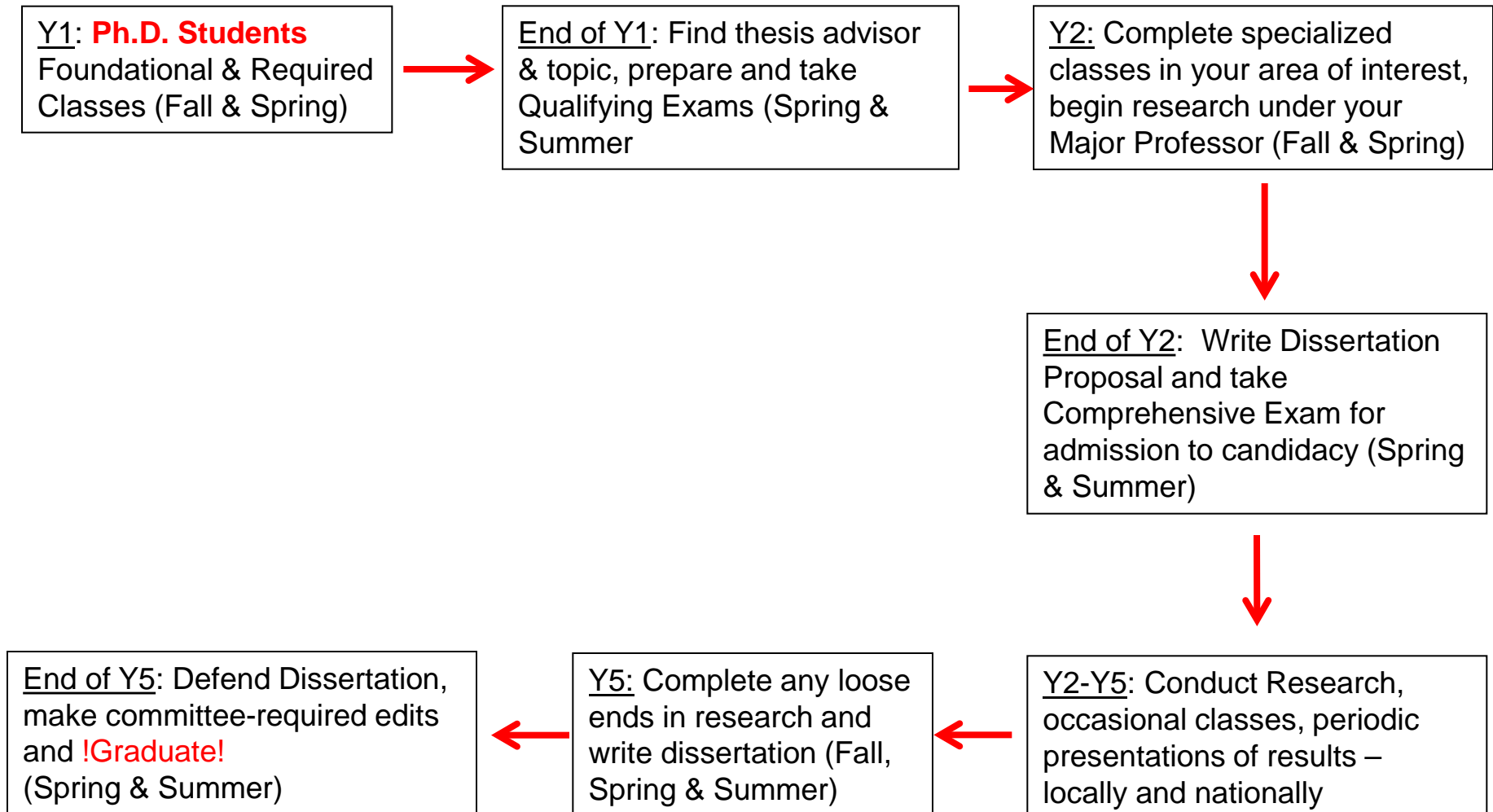
What is the Timeline or Sequence of Events?

[Typically 2 years, for full-time students, M.S. (thesis or not)]



What is the Timeline or Sequence of Events?

[Typically 5 years, for full-time students entering with an M.S., pursuing a Ph.D.]



What about the Accelerated MS or BS/MS Programs?

- Depending on the program, allows from 9-12 credits to be double-counted toward both your B.S. degree and your M.S. degree.
 - Saves money
 - Saves time, M.S. can (with hard work) be earned in 1 year
 - Depending on program, both thesis and non-thesis options

How do I find out more?

- **Programs:** Departmental Head or Program Coordinator can give you all the details about your particular (potential) program
- **Funding and Assistantships:** Departmental Head or Program Coordinator
- **Costs and Application Procedures (@SDSMT):** Graduate Office (Rachel and Trudy), Room 2201, on the 2nd floor of the Chemistry Building:
 - <http://www.sdsmt.edu/GraduateEducation/>

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Questions?