Electrical and Computer Engineering Graduate School Information Session

slides available:

`http://hkn.umn.edu/tutorials.html`

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Outline

Why should I consider graduate school

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Why should I consider graduate school?: Good Reasons

- I love this EE/CompE stuff
- I want to work in areas that require more training
  - VLSI (MS degree may be required)
  - Optics, RF, Magnetics, Electron device development, etc. (MS or PhD may be required)
- I want a more interesting job
- I want to be more competitive in future employment opportunities
  - Advanced electrical engineering degrees are in high demand by both Fortune 500s and start-ups. Source: Career explorer

Why should I consider graduate school?: Good Reasons

- I want to work in academia or a national research lab
- I want to be an entrepreneur and need to raise capital
- I want to be considered for technical leadership positions
- I want to tell other people what to do (rather than the other way around)

Why Should I consider Graduate School?: Questionable Reasons

- Prestige
- I want to make more money
  - Electrical engineer starting salary for BSEE degrees averages $61,420. New MSEE graduates have an average starting salary of $72,340; and new PhDs have an average starting salary of $88,970. Source: Career explorer
- I cant get a job (or am too lazy to look for one)
- Family and peer pressure

When Should I go to graduate school?

- Right after UG school
  - If you have the motivation and are sure this is for you, go for it
  - Keeping a student life style is easier
- After working in industry for a few years
  - Gives you a chance to assess whether grad school is necessary and whether you are truly interested in a subject
  - Re-adopting a student lifestyle can be a challenge
- MS program with a full-time job
  - Allows you to keep your decadent lifestyle
  - Takes forever to complete program. Harder to do experimental work

My personal career trajectory

- 4 years as an undergrad (Torture!)
- 6 years as a grad student (Fun!)
- 1 year as a teaching professor (Fun!)
- 2 years in industry (Not Fun)
- 7+ years at a national laboratory (Fun!)
- 28 years in academia (Nirvana!)

What should I do to get ready for grad school?

- Get to know some faculty well. Get those letters of recommendation lined up
- Work in a research lab (or two)
- Use UG electives to explore areas of interest
- Start researching where to go (including UMN!)
- Visit schools and do some research into faculty at each institution
- Talk to graduate students in various groups

Applying to Grad School

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First Considerations

- Masters or PhD?
  - What type of career do you want?
  - What subfield?
- Get to know faculty
  - They write letters
  - Do research if possible

Preparing to Apply

- Look for Fellowships:
  - I Often have earlier deadlines
  - I Getting a fellowship gives greater flexibility
- Where would you like to go?
  - Quality of school / program / specialization
  - Geography
  - Cost / funding opportunities
  - Changes of getting admitted?
- Ask for letters
  - The closer the writer to your subfield, the better
  - Ask early. Writing good letters takes time

The Main Components

- CV
  - Highlight parts relevant to desired field
  - Have someone else check it over
- Statement of Purpose
  - Focus on your professional / research goals
  - Be specific about what you want to do and why
- GREs
  - Good GREs wont get you in. Bad GREs will keep you out.
  - Determine if you need a subject test (rare for engineers)

Five Year Masters

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Five Year Masters

- Easy to Apply (No GRE, No LORs)
- Get your Masters quicker
- Save tuition dollars (Maybe even get paid!)
- Very Flexible Completion Pathway
- A Path to the PhD
- Application Deadline: Oct. 15

Electrical and Computer Engineering: Degree Program Information

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(some slides taken from earlier presentations)

Website

- Go to `www.ece.umn.edu/graduate/index.htm`
- Otherwise, go to `www.ece.umn.edu` and click on Academics then click on Graduate
- Read all the rules

Graduate Degree Plans

- MSEE Plan A Thesis:
  - 10 Thesis Credits,
  - 14 Major Field (can include 6 credits EE 4XXX),
  - 6 Minor/Related Field
- MSEE Plan C Coursework:
  - 18 EE Major Field (no EE 4XXX),
  - 6 Minor/Related Field (from the approved list),
  - 6Additional (can include EE 4XXX)
- PhD:
  - 14 Major Field (no EE 4XXX),
  - 12 Minor/Related Field (from the approved list), 14 Additional (6 Credits of 8XXX minimum)(can include EE 4XXX)
- Up to 6 credits EE 4XXX allowed (total EE and non-EE 4XXX cannot be more than 9 credits

Minimum Degree Requirements

- Minimum GPA Requirements
  - 3.0 minimum GPA for MSEE
  - 3.3 for PhD
  - 3.3 for MSEE students interested in advancing to PhD program
  - C- grade is not acceptable toward degree requirements
- Failure to maintain GPA will result in registration hold
  - WPE (Written Prelim Exam) for PhD degree requires a 3.3 GPA. Can petition for waiver

PhD:Stages

- Written Preliminary Exam
  - Breadth of Knowledge Requirement
  - Depth Exam
  - No order in which these need to be completed
  - Recommended completion: By the end of the first year or the first semester after the first year
- Oral Preliminary Exam
  - Recommended completion: By the end of the third year
- PhD Defense
  - Typical completion time: 5 years

PhD Students

- Conduct outstanding research
- Get involved in helping faculty advisors in writing proposals

MSEE students

- I want to do a PhD instead of MSEE. What should I do?
  - Find a research advisor
  - Pass the PhD WPE.

Typical time to get a degree

- MSEE
  - 2 years for full time
- PhD
  - 4 years for PhdD with MSEE entry
  - 5 years for PhD with BSEE entry

How can I get involved in research?

- For MSEE Plan C students
  - Not a suitable plan for research
- Best way to do research is to impress a professor your research interests overlap with his/her
- Plan A students must find Thesis Advisor
- Plan C students can register for EE-8965 Project Course if they find an Project Advisor

Graduate Students

- Front line researchers
- Faculty are most eager to have strong graduate students as their research assistants
- This is the best time to do research!
- Get involved in inter-disciplinary research. Take advantage of DTC, NFC, MINT, and other centers on campus.

Funding Opportunities

- TA/RA/Fellowship
- Other departments may have support
  - Do not bombard other departments faculty with emails.
- Explore fellowship opportunities.
  - Check: Prospective/Graduate Link of the ECE Department webpage

I-CORPS

- A set of activities and programs that prepares scientists and engineers to extend their focus beyond the laboratory and broadens the impact of select, NSF-funded, basic-research projects.
- Entrepreneural Lead
  - a graduate student or a post-doc
- Mentor:
  - entrepreneurial experience and serves as the principal guide in determining the technology disposition.
- PI:
  - serves as the technical lead and project manager.

Student Panel

Student Panel

- Seth Barash - Master's Student
- Vivek Khatana - PhD student
- Anusheree Ramanath - PhD student
- Yadu Kiran - PhD studnet