Graduate Students Orientation: Electrical Engineering & Computer Engineering

Prof. Gil Zussman
MS Advising Committee Chair
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>10:15 – 13:45</td>
<td>Introduction to the EE and CE MS programs (relevant also to most Ph.D. students) Overview of classes Career Services Lunch / Student panel</td>
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<td>2:00 – 5:00</td>
<td>Advising appointments for MS students (Mudd, Schapiro, CS Building) 7 Open Labs (Mudd, Schapiro, NW Corner)</td>
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<td>2:00 – 2:45</td>
<td>Introduction to CE classes – for CE students (Schapiro 414)</td>
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<td>2:15 – 3:00</td>
<td>Introduction to the Ph.D. program – for Ph.D. students (Mudd 1300)</td>
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Locations and Appointments

- Detailed agenda and building/lab locations - in the folders
- Slides will be available online
- Advising appointments
  - For EE – available online (link from the EE department main page)
  - For CE – were sent to the students
- Most advising appointments take place today (2:00-5:00pm)
- Some will take place in the following days
EE Department Research and Teaching

- 5 main focus areas:
  - Networking and Communications
  - Signal and Information Processing
  - Circuits and Electronics
  - Photonics, Solid State Devices, and Electromagnetics
  - Systems Biology and Neuroengineering

- 5-10 faculty per area (including overlaps and joint appointments with other departments)
EE/CE MS Program

- 30 credits total
  - all at 4000 level or above
  - min. 15 credits at 6000 level  (CompEng: all in EE or CS)
  - min. 15 credits in EE
  - CompEng: min. 15 credits from “core” (min. 6 in EE and CS)
  - max. 6 credits for research projects  (CompEng: max 9 credits)
  - max. 3 credits for classes outside science/engineering and for non-technical classes within the engineering school
  - no credit for Math/Science classes covering traditional undergraduate material (e.g., basic statistics)
  - minimum 2.5 GPA  (at any point in time)
  - complete within 5 years
EE/CE MS Program

• Normal load for full time students: ~12 credits/semester
  – i.e. 3 semesters to complete MS
    • Fall/Spring/Fall or Fall/Spring/Summer (more common among Ph.D./domestic students)
  – 12 credits per semester is a DHS limits - for questions refer to Columbia ISSO

• Each student has the responsibility to ensure that his/her selected courses satisfy all requirements, especially if he/she is constrained by a deadline such as that imposed by a student visa
  – We do not verify every semester that the classes that you take satisfy the requirements
  – If there is any doubt, seek advice
This form serves as an unofficial checklist for the requirements of the M.S in Electrical Engineering.

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### M.S.E.E. Degree requirements:

1. ___ 30 points of credit, all 4000-level or above and taken for a letter grade (i.e., no P or R grades).
2. ___ 15 points at or above 6000 level.
3. ___ 15 points in EE (including joint courses).
4. ___ No more than 6 points research (e.g., ELEN E4998, ELEN E6001, ELEN E6002).
5. ___ No more than 3 points total for courses that are:
   a. Outside of SEAS and the Math & Science departments; or
   b. Non-technical courses within SEAS and the Math & Science departments, e.g., IEOR E4702 Human Factors. (Economics and Business courses fall in category a.)
6. ___ No credit for Math & Science courses covering traditional undergraduate engineering topics (e.g., STAT W4105 Probability).
7. ___ 2.5 GPA minimum.
8. ___ Completion within 5 years.

All coursework must be approved by a faculty advisor, if there is any question about items 5-6.
Each student has the responsibility to ensure that their selected courses satisfy all requirements, especially if he or she is constrained by a deadline such as that imposed by a student visa.

Last updated Aug. 2012. Students whose program started before Fall 2012 can use the checklist that was in effect when their program started.
Concentrations

• MSEE can have an optional ‘concentration’
  – a particular set of coordinated courses to cover a certain field

• Bulletin lists several options
  – Multimedia Networking, Telecommunications Engineering, Lightwave Engineering...

• These are just suggestions!
  – You are free to put together your own program
Selecting your Classes

- In the folders (and online) – lists of EE, CS, and APAM classes

- Depth-area flowcharts (in the folders and the website) indicate dependencies and sequences
  - If in doubt regarding a pre-requisite – discuss with the instructor

- The classes in the different areas will be discussed later today

- Do not limit yourself only to EE classes – explore other departments
Selecting your Classes

• Register by Friday
• **Attend many possible classes next week**
• Last day to add/drop with tuition refund – Fri. Sept. 13
• Last day to drop a class (with no refund) – Tue. Oct. 8
• Dates in the folders
• Waiting lists for some COMS and CSEE classes can be found in the CS website
Advising

• An MS student should meet a faculty advisor once a semester to discuss class registration
  – a useful resource for other topics
  – any EE faculty member
  – ideally, talk to a single faculty in your area of interest
  – This afternoon – matched students with faculty in their area

• Talk to students during the open lab session
• Talk to the EE ambassadors
Research

• Videos of the 2011 Research Overview Day available in the EE website
• The MSEE program allows up to 6 units of research
  – ELEN E4998/ELEN E6001
  – typically 3 units/semester max.
  – (CompEng: 9 units)
  – Paid position are usually available during the summer
• Requires faculty supervisor
  – .. a significant time commitment
• No formal structure
  – .. just need to establish a relationship
  – .. e.g. through coursework, discussion with Ph.D. students
• Open labs today are a good source of information
• Doing well in classes and looking for a spring project is usually a good idea
Doctoral Qualifying Exam

- Oral/written exam **required** of students on Ph.D. track
  - MS students **may** take as evidence of their abilities
  - .. but they must still apply to the Ph.D. program (and be accepted)!
  - .. which means finding a willing Ph.D. **supervisor**
- Held in January every year
  - best taken at earliest opportunity
- Written exam covers undergraduate-level **material** at graduate-level **sophistication**
  - 6 areas
  - more details on EE web site
- Oral exam consists of three 15 minute one-on-one interviews
Lab Assistant and Grader Positions

• A limited number of Lab Assistant and Grader positions are available
• Application form available in the website:
  • http://www.ee.columbia.edu/pages/jobs/for_students/index.html
• CE students can also apply for CS dept. positions: ta.cs.columbia.edu
• EE students can also try (may be more relevant in the spring)
Internships and Curricular Practical Training (CPT)

• A summer internship is an important step towards finding an industry position
• Presentation by the Center for Career Education later today
• Apply in time

• For international students – requires registering for CPT
  – Requires an advisor
  – A 1 credit class
  – Submit a report and employer evaluation at the end of the summer
• Under some conditions can also be done in the last semester

• Summer research positions are also available
Information Resources

• Attend other orientation events, go over SEAS orientation package
• Ask students in the open labs
• EE, CE web sites
• The SEAS Bulletin
  – http://www.engineering.columbia.edu/bulletin/
• Ask the faculty/staff:
  – MS committee (Professors Jelenkovic, Krishnaswami, Seok, Wang, and Zussman)
  – Elsa Sanchez, Student Affairs Coordinator