ECSE Doctoral Program Meeting

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ECSE Graduate Program Director (GPD)

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Who Should Be Here?

◆ Anyone who is considering a PhD in

ecse

Outline

- ECSE Graduate Program People.

- Overview of Doctoral Program.

- Doctoral Qualifying Exam (DQE).

- Doctoral Candidacy Exam (DCE).

- Thesis Defense Examination (TDE).

- Registration and Doctoral Plan of Study.

- Questions?

ECSE Grad Program People

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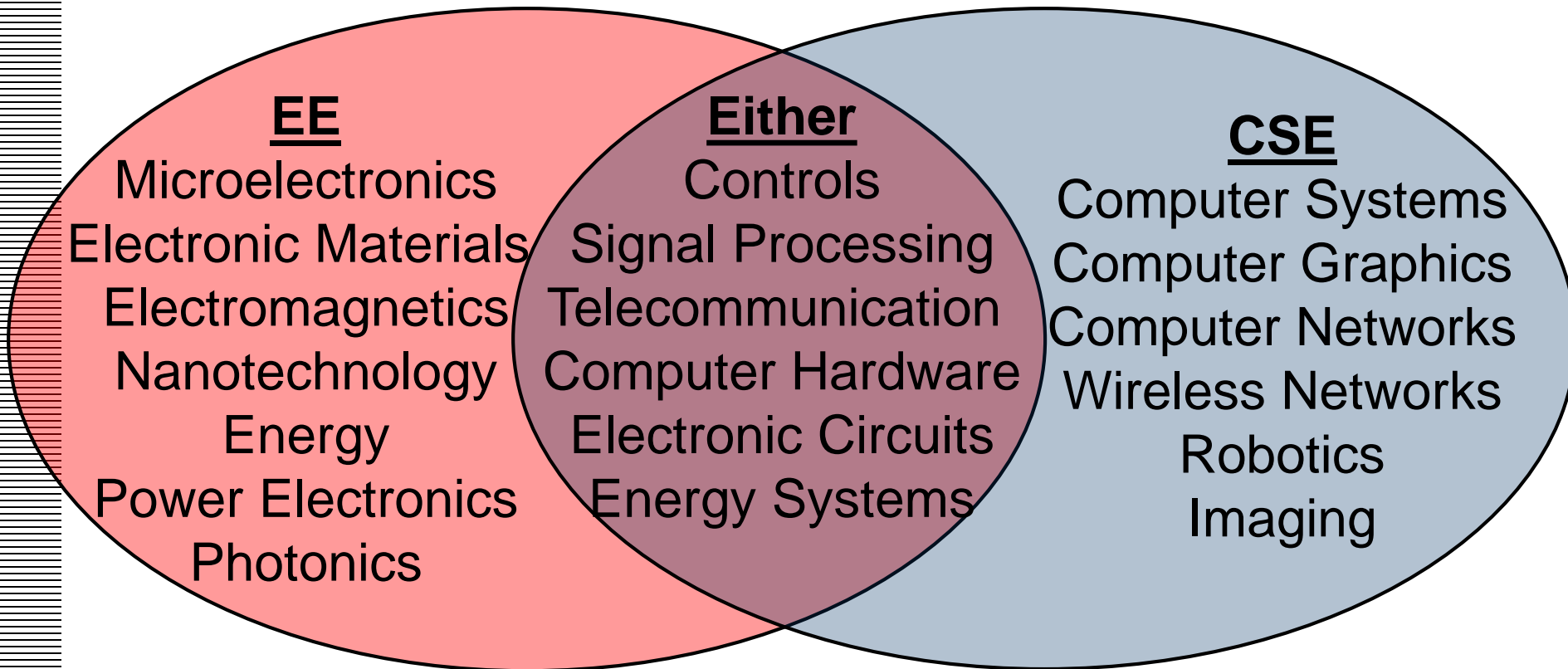Phone: 518-276-8277

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Doctor of Philosophy Degrees

- ◆ ECSE offers a PhD in Electrical Engineering OR in Computer and Systems Engineering.
- ◆ EE vs. CSE doesn't matter in any degree requirements, just area of research:

EE
Microelectronics
Electronic Materials
Electromagnetics
Nanotechnology
Energy
Power Electronics
Photonics

Either
Controls
Signal Processing
Telecommunication
Computer Hardware
Electronic Circuits
Energy Systems

CSE
Computer Systems
Computer Graphics
Computer Networks
Wireless Networks
Robotics
Imaging

Why Get a PhD?

- ◆ Short answer: Because you want to do the kind of work that PhD's do.

- ◆ Primarily, this means Research.

- ◆ It could be as a professor at a university, or as a research staff member in a government lab, or in industry.

- ◆ Probably not good reasons:

  - ■ "My parents/friends will be impressed."

  - ■ "I will be impressed."

  - ■ "I don't feel like getting a real job just yet."

Major Steps to a PhD

1. Find Research Advisor willing to advise your PhD.

2. Submit a Doctoral Plan of Study.

3. Start doing research.

4. Take the Doctoral Qualifying Exam (DQE)

   - No later than 2nd semester if admitted with Masters

   - No later than 3rd semester if admitted with only BS.

5. Form Doctoral Committee.Y2

6. Pass Doctoral Candidacy Exam (DCE).Y3

7. Complete Doctoral Thesis & pass Thesis Defense, with appropriate Committee sign off. Y3+, <5 years after MS/Meng, < 7 years after BS

PhD Timeline Examples

Ex1		DQE			DC	DCE		TDE

Ex2			DQE		DC		DCE		TDE

Ex3		DQE			DC		DCE	TDE

- ◆ Ex1 and Ex2 are valid plans.

- ◆ Ex1 jointed after MS, while Ex2 joined after BS.

- ◆ Ex3 is not allowed because DCE and TDE are not separated by at least one year – Ex3 should have taken the DCE earlier.

Doctoral Qualifying Exam (DQE)

DQE

◆ The purpose of the DQE is to determine the potential that you will be able to complete the Doctoral requirements, including original and independent research of high quality.

◆ The DQE consists of <u>3 Components</u>:

- <u>4 Oral Exams in 3 Areas</u>: 1 Basic Area Exam, 2 Major Area Exam, 1 Minor Area Exam.

- <u>Course Grades</u>: Your grades in courses taken at RPI. This serves as the "written" part of the DQE.

- <u>Research Advisor's Recommendation</u>: Your Thesis Advisor will submit a written evaluation of your research so far.

DQE Step 1: Choose Areas

♦ **Basic Exam**: One area from the **Basic Group**.

♦ **Major Exams**: One area from the **Elective Group**.

♦ **Minor Exam**: One area from the **Basic or Elective Group**, not previously selected.

Basic Group

1. Physics
2. Mathematics
3. Computer Science

Elective Group

4. Circuits and Electronics
5. Control
6. Communications
7. Plasmas & Electromagnetics
8. Microelectronics Technology and Design
9. Computer Systems
10. Computer Design
11. Image Analysis & Computer Vision
12. Electric Power Eng'g

Consult with Advisor!

The DQE Process: Steps 2 & 3

- <u>DQE Step 2</u>: Submit the application for the DQE to Priscilla in JEC 6009.

    - <u>Application Deadline this semester</u>: September 10th by NOON.

- <u>DQE Step 3</u>: The GPD assigns ECSE faculty to examine you in the areas you selected.

    - Your advisor cannot be one of your examiners.

    - If you need to take it a 2nd time, you will get new examiners, if possible.

    - Assignment letters emailed to you during week of Sept.16

The DQE Process: Steps 4 & 5

- ◆ <u>DQE Step 4</u>: You and each Faculty Examiner schedule a time for that Exam during the Examination Period.

  - You can try to schedule each exam as you wish within the constraints of the Examiner's schedule.

- ◆ <u>DQE Step 5</u>: The 4 Oral Exams are given over a 2-week period.

  - <u>Examination Period</u>: September 23-October 4(inclusive)

  - Each Exam is approximately 1 hour.

  - You may be given written or oral questions.

The Decision

- ◆ The ECSE Faculty meet to discuss each student including the results of these Oral Exams, the Course Grades, and the Research Advisor Recommendation.

    - Fall 2019 DQE Faculty Review Meeting will be held Wednesday, October 9th.

    - You will be notified in writing on October 10th.

- ◆ If you do not pass the first time, you will be able to take the DQE one more time, in the next semester.

Examiner Input, Part 1

◆ Your Examiner grades the Oral Exam according to the following categories:

   i. Knowledge of Subject Matter;

   ii. Ability to Analyze Problems and Formulate Solutions;

   iii. Performance in Correctly Responding to Questions.

◆ Point Values given by examiner for each of above:

   5: Representative of RPI's Best Doctoral Students;

   4: Representative of a Good Doctoral Student;

   3: Typical of a Marginally Adequate Doctoral Student;

   2: Less than Expected of a Doctoral Student;

   1: Definitely Inadequate Performance.

Examiner Input, Part 2

♦ Your Examiner then provides written comments on your performance and the likelihood that you will be able to complete the research requirements for the Doctorate.

♦ Your Examiner recommends (either "Yes" or "No") that you pass your individual Exam.

Research-Advisor DQE Input, Part 3

◆ Your Research Advisor provides the following evaluation of your research work to date:

i.   Self-Reliance or Ability to Work with Minimum Supervision;

ii. Creativity or Ability to Come Up with Original Ideas;

iii. Motivation and Dedication to Accomplishment;

iv. Ability to Communicate in Writing.

◆ Point Values: The same 1–5 pt. scale as the Oral Exams, or, possibly, "Unable to give a score at this time."

◆ Your Research Advisor comments on the likelihood that you will be able to complete the requirements for a doctorate.

Course Grades

ECSE

- ◆ A list of grades that you have received at Rensselaer as a graduate student is included in the information provided to the ECSE Faculty at the meeting where passing is determined by a vote of the faculty.

- ◆ The faculty also have access to your student files should questions arise.

DQE Score Sheet

◆ The scores of typical students will look like this:

Student	Basic	Major 1	Major 2	Minor	Total	Research	A	B	C	F	GPA
Jane PhD	1/KC 3 4 4	6/BS 4 5 4	6/KV 3 4 3	2/KK 4 3 3	44	IB 3 2 4 3	5	1			3.8
Joe PhD	2/JC 3 4 3	8/YL 4 5 4	8/LP 3 3 3	7/AA 2 3 2	39	IB 3 2 4 3	2	1			3.7

◆ Research is an important aspect of the doctoral program and significant <u>engagement in research</u> activities should occur <u>before</u> taking the DQE.

◆ Passing the DQE has a tight linkage to a Research Assistantship.

◆ The exam is given twice per year: once in September, once in February.

◆ You can take the DQE at most twice.

Doctoral Committee

Doctoral Committee

- Your Doctoral Committee must be formed <u>before</u> the DCE, preferably well before, with the advice of your advisor and the consent of the members.

- It must be approved by the GPD & Grad School.

- Your advisor will be the chair of your committee.

- If your advisor is not a full-time tenure-track faculty in ECSE, then you must have a co-advisor who is.

- The Committee must have 4 members including at least 3 full-time tenure-track RPI faculty members, and one member <u>not</u> from ECSE.

- The typical committee has 3 from ECSE and one from another department or outside RPI.

Doctoral Candidacy Exam (DCE)

DCE

- After forming your Doctoral Committee.

- Prepare a written <u>Thesis Proposal</u> which includes
    - Concise discussion of the proposed thesis effort,
    - In-depth review of the pertinent literature,
    - Preliminary results which suggest that the effort will be successful.
    - Typically 25-50 pages.

- Arrange a date for the DCE with your Committee.

- Distribute the Proposal to your Doctoral Committee at least one week before the exam.

DCE continued

◆ The <u>DCE</u> is an Oral Exam conducted by your Doctoral Committee.

◆ The format of the exam is determined by the committee, but typically involves a presentation by the student of approximately 45 minutes followed by questions to the student from the committee.

DCE continued

- ◆ Can be taken any time <u>after</u> passing the DQE.

- ◆ Should be completed no later than the 3rd year.

- ◆ OGE says "the candidacy exam is a test of the student's ability to conduct research, including formulating a hypothesis, proposing research methods and gathering preliminary results. The candidacy exam is not a 'pre-defense' and should not be treated as such."

- ◆ At least one year between DCE and Defense, so don't delay the DCE!

ECSE

Thesis Defense Examination (TDE)

TDE

- ◆ Present and defend your thesis research before your Doctoral Committee and the public.
- ◆ The TDE should be held by the deadline listed in the Academic Calendar for that semester.
- ◆ Your Doctoral Committee signs the Record of Dissertation Examination form (assuming the thesis is acceptable).
- ◆ Submit your final thesis to the Grad School.
- ◆ Note: Read about plagiarism on Grad School website!
- ◆ Pay any outstanding fees and parking tickets.

Guidelines for Doc Prog

[Recommended](#) times for completing milestones:

Milestone	Semester (from BS)	Semester (from MS)
Find Advisor	1	1
Plan of Study	1	1
Take DQE	3	2
Form Committee	5	4
Pass DCE	6	4
Thesis Defense	8	6
Finish	8	6

"Semester" here refers only to fall and spring.

Deadlines for Doc Prog

Required times for completing milestones:

Milestone	Semester (from BS)	Semester (from MS)
Find Advisor	1	1
Plan of Study	1	1
Take DQE	3	2
Form Committee	6	5
Pass DCE	7	6
Thesis Defense	14	10
Finish	14	10

Deadlines can be extended,
but only with special permission.

Registration
and
Doctoral Plan of Study (PoS)
Doctoral Student Yearly Review (DSYR)

Registration Requirements

Per Semester Load:

◆ Minimum 12 Credits, Maximum 16 Credits

- Full time, including RAs!

- Only Exception: TA minimum = 9 credits.

- All graduate students should take 16 credits every semester until their last.

Pre-2016 Start

- ◆ 72 Credit-Hour Plan of Study (PoS)

  - Approved by Advisor & GPD.

- ◆ Pass DQE.

- ◆ Pass DCE.

- ◆ Written Thesis & Defense, approved by your Doctoral Committee.

- ◆ Minimum 3.0 GPA.

PoS Rules

ECSE

72 Credit-Hour PhD Plan of Study (PoS)

◆ 48 credits beyond the Master's Degree

◆ A relevant Master's should be reflected in the 72-credit Doctoral PoS on one line worth 24 credits.

◆ It is counted as a 24-credit block at 6000-level in a 24-credit Doctoral PoS regardless of the actual number of credits earned in the Master's.

◆ Doctoral Dissertation Credits account for time spent on research: 12 credit minimum / 36 credit maximum.

◆ You will have more than 72 credits at the end.

PoS Rules - continued

72 Credit-Hour PhD Plan of Study (PoS) _{continued}

- ◆ Ratio of 6000-level to 4000-level Credits on 72-credit PoS must be 2 or greater.

- ◆ <u>Maximum of 15 credits at 4000-level</u>.

- ◆ Plan of Study (PoS) must be approved by your advisor, ECSE GPD, & Grad School.

  - ■ After getting your advisor's signature, give to Priscilla.

- ◆ Minimum 3.0 GPA on all PoS courses to graduate.

- ◆ You must also take at least one Math course.

Plan of Study (PoS)

- ◆ Need to submit your PoS (and all other grad program forms) <u>directly</u> to Priscilla.

- ◆ If you are a first semester grad student, you should do this within the next 2 months.

- ◆ Everyone else should have one on file already.

- ◆ You can <u>revise</u> and <u>update</u> as necessary.

- ◆ The official <u>Institute PoS Form</u> is on the Office of Graduate Education (Grad School) Web site.

- ◆ Remember for Doctoral students:
    - ■ Academic Advisor = Research Advisor.

DSYR

- Doctoral Student Yearly Review

- Filled by you, with comments from Advisor

- Includes:

  - Main Milestones dates

  - Accomplishments for Past year

  - SMART goals for upcoming year
    - Specific, Measurable, Attainable, Realistic, and Time-bound

  - Anticipated funding for upcoming year

  - Has student met expectations?
    - Yes, No, or Needs improvement

Questions?