ECSE Graduate Programs

Professor Partha Dutta
Ms. Leslie Davis

August 26, 2019
Graduate Program Directors

Prof. Alhussein Abouzied
GPD (Doctoral)
Office: JEC 6012
Email: abouzeid@ecse.rpi.edu
Phone: 518-276-6534

Prof. Partha Dutta
co-GPD (Master’s)
Office: CII 7231
Email: duttap@rpi.edu
Phone: 518-276-8277

Student Services Staff

Leslie Davis
Sr. Student Services Administrator
Office: JEC 6003
Email: davisl4@rpi.edu
Phone: 518-276-2554

Priscilla Magilligan
Administrative Secretary
Office: JEC 6009
Email: pris@ecse.rpi.edu
Phone: 518-276-6225
ECSE Student Services Office

What we provide

- Central Location
  - Forms, information, and questions.

- Source of support
  - Point of contact for all matters throughout entire academic career.
  - Foster a supportive, stable, inclusive environment.

- Communication hub
  - Institute and Department policies.
Agenda

- Graduate Degrees
- Required Paperwork
- TA/RA Expectations
- Registration Requirements
- Mercer Distinguished Lecture Series
- Doctoral Program Overview
- Master’s Program Overview
ECSE Research Areas

AI and Machine Learning Systems
Communications & Computer Networking
Computer Hardware Design
Controls, Robotics, and Automation

Electronics & Photonics
Imaging Science & Computer Vision
Power Electronics & Power Systems

https://www.ecse.rpi.edu/research
World Renowned Scholars
ECSE Graduate Programs

Master’s Programs
- Master of Engineering (ME)
- Master of Science (MS) with Thesis
- Master of Science (MS) without Thesis
- Co-terminal program (for undergraduate students)

Doctoral Program
- Doctor of Philosophy (PhD)

Doctoral students may add a Master’s degree while completing their PhD requirements.
Master’s students may apply to the doctoral program
Graduate Plan of Study (PoS)

- A Plan of Study (PoS) must be on file with Office of Graduate Education (OGE) for all graduate students.

- Deadline to submit PoS to our office:
  - Master’s & Doctoral Students: 11/19/19 (Tuesday before Thanksgiving break).
    - Master’s students must also submit MS Worksheet.
  - Co-Terminal Students: 4/22/19 (before classes end for the semester).

- Plans of Study are brought to Priscilla for GPD signature.

- Plans of Study can be revised as needed.
Required Paperwork

- **Orientation Packet paperwork & deadlines**
  - TA Information Sheet – Monday by Noon
  - Intellectual Property Agreement – 9/9/19
  - Communications in ECSE – 9/9/19
  - Program/Research Advisor – 10/1/19

- **Master’s Program Paperwork**
  - Nomination of Master’s Thesis Committee*
  - Record of Master’s Thesis & Oral Presentation*

- **Doctoral Program Paperwork**
  - Doctoral Committee Nomination
  - Record of Candidacy Examination
  - Record of Dissertation Exam*

- **Other paperwork**

*Deadlines for each semester are posted on the Academic Calendar. Reminders will be sent on a semester basis.
**TA/RA Expectations**

- You are considered an employee of the Institute:
  - Show up on time.
  - Do the work thoroughly and completely.
  - Communicate with your advisor and/or Student Services.

- **Time Off**
  - RAs: Discuss with your advisor well in advance.
  - TAs: You must be available throughout the semester. You cannot leave for break without checking when the final grading will be done.

- **ECSE TA Best Practices**
  - Tuesday, August 27\textsuperscript{th} JEC 6309 at 1:00 p.m. Attendance is required.
    - In JEC, room number 63XX means 6\textsuperscript{th} floor, 3\textsuperscript{rd} side corridor.
    - 60XX would be in the main corridor.
Are You Properly Registered?

(Essential if you want to be a TA/RA and get paid)
Why is this important?

- Financial aid cannot be entered into the system until you are registered. You cannot be paid until this is entered.

- Registration deadlines:
  - TAs – Tuesday, 8/27 by Noon.
  - RA and Self Pay – Thursday, 8/29 (1st day of classes).

- If you are a Teaching Assistant:
  - You must turn in your fall class schedules to Priscilla by noon on Tuesday.
  - Prof. Lu uses this information to ensure your TA assignment does not conflict with your course schedule.
  - Assignments will be sent via email.
Master’s (excluding Co-Term) and Doctoral:
- Full-time status: 15 credits maximum
- Full-time status minimum:
  - 9 credits for TA
  - 12 credits for RA and Self Pay

Co-Terminal:
- Full-time status minimum is 12 credits.
- Maximum 21 credits if course load is predominately UG courses.
- Students should aim for 15 credits per semester, especially if taking graduate level courses.
- You must follow OGE requirements once the bachelor degree is completed.
ADD/DROP Deadlines

- Add Deadline: September 13, 2019
- Drop Deadline: October 27, 2019
- Late Adds are not permitted. OGE will NOT approve.
- You cannot drop a course if it lowers your load below the minimum full-time requirements
- Aim to adhere to a 15 credit course load to avoid any registration problems.
Mercer Distinguished Lectures

Darrin Communications Center (DCC) 324
Refreshments: 3:30 p.m., Lecture: 4:00 – 5:00 p.m.
Fall 2019 Schedule:

**HVAC System Control and Optimization**
Scott Bortoff, Mitsubishi Electric Research Laboratories
Wednesday, September 25

**Topological Quantum Computing and Majorana Fermion**
Kang Wang, UCLA
Wednesday, October 30

**Model-Based Design and Systems Engineering**
Hubertus Tummescheit, Modelon
Wednesday, November 13

Attendance is mandatory.
Important Links!

- [www.rpi.edu](http://www.rpi.edu)
  - RPI Web Page

- [www.ecse.rpi.edu](http://www.ecse.rpi.edu)
  - ECSE Web Page
  - Master PoS Files, a copy of these slides! (“academics” link)
  - Research Areas, Advisor Interests, etc.
Important Links!

- rpinfo.rpi.edu
  - Course Catalog
  - Institute Directory, Academic Calendar (Add/Drop Deadlines!), Final Exam Schedule, etc.

- sis.rpi.edu
  - Class-Hour Schedule
  - Special-Topics Courses and New-Course Descriptions, etc.
ECSE Doctoral Program
ECSE Doctoral Degrees

- Doctor of Philosophy Degrees:
  - PhD in Electrical Engineering
  - PhD in Computer and Systems Engineering
Doctor of Philosophy (PhD)

- Preparation for a Research Career (in Academia, Government, or Industry).
- Emphasis on depth in research area.

1. Find a Research Advisor.
2. Take **DQE** in 2\textsuperscript{nd} semester if admitted with Masters, in 3\textsuperscript{rd} semester if admitted with only BS.
3. Form **Doctoral Committee**.
4. Pass **DCE** in 4\textsuperscript{th} semester of doctoral study.
5. Complete **Thesis** and pass **Defense**, with appropriate Committee sign off.
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 3 Parts:

- **4 Oral Exams**: 1 Basic Area Exam, 2 Major Area Exam, 1 Minor Area Exam.
- **Course Grades**: Your grades in courses taken at RPI. This serves as the “written” part of the DQE.
- **Research Advisor’s Recommendation**: Evaluation of your research-to-date.
DQE 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
More detail on DQE at Doctoral Program meeting next Wednesday, 9/4, 4pm, JEC 3117.

The DQE is relevant today because you must register this week.

You should consider if you need to take one course to help you prepare for the DQE.

You must balance this vs. taking courses to prepare for research and not overloading yourself.

3 courses should be the max this semester if you have a TA or RA (the rest is thesis credits).
PhD should take about 3 years beyond a Masters or 4–5 years beyond a BS to complete.

- Maximum time period is
  - 5 yrs after MS/MEng,
  - Or 7 yrs after BS if no Masters,
  - This is RPI Policy (not ECSE).
  - Extensions can be granted, but discuss with us as early as possible.

- Academic Advisor = Research Advisor.
Doctoral Requirements

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.
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.
- Maximum of 15 credits at 4000-level.
- Plan of Study (PoS) must be approved by your advisor, ECSE GPD, & Grad School.
  - After getting your advisor’s signature, give to Priscilla in JEC 6009.
- Minimum 3.0 GPA on all PoS courses to graduate.
- You must also take at least one Math course.
Written Thesis & Defense, w/Committee Sign-Off

- The heart of the PhD: Must contain a “substantial original contribution to knowledge.”
- Proposal of research at Candidacy Exam (DCE) in front committee of 4 or more faculty.
- Defense: Public presentation in front of committee. Must be open to anyone.
Research Area Chairs

- AI and Machine Learning: Prof. Ali Tajer
- Communications and Computer Networking: Prof. Koushik Kar
- Computer Architecture and Hardware Systems: Prof. Tong Zhang
- Control, Robotics & Automation: Prof. Agung Julius
- Electronics & Photonics: Prof. Partha Dutta
- Image Sciences and Computer Vision: Prof. Richard Radke
- Power Electronics and Power Systems: Prof. Joe Chow
Questions?
ECSE Master’s Programs
ECSE Master’s Degrees

- Master of Science (MS) with or without Thesis
  - MS in Electrical Engineering
  - MS in Computer and Systems Engineering
  - MEng in Electrical Engineering
  - MEng in Computer and Systems Engineering
- ME, MS w/ or w/o Thesis can be used for Co-Terminal, but MS w/o Thesis degree is most typical
Differences Among Degrees

- w/ vs. w/o thesis matters a lot in PoS requirements.
- EE vs. CSE doesn’t matter in PoS Requirements, just area of concentration/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

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Master of Engineering

- Preparation for Professional Practice
- Semesters to complete: 2 possible w/ heavy load; 3 semesters more typical.
- 3-Course Technical Concentration.
- 2-Course Non-Technical Sequence.
  - MGMT/ECON/ courses encouraged.
- Max time period 2-1/2 yrs (Grad School Policy).
- Professional Master’s Project an option but not typical (need a voluntary Advisor for this).
- Academic Advisor = an ECSE Faculty or GPD.
Master of Science with Thesis

- Preparation for Research Career and/or a PhD
- Emphasis on depth in research area.
- 3 semesters to complete (recommended).
- Max time period 2.5 yrs (Grad School Policy).
- Master’s Thesis required: Need 6 (or 9) credits of ECSE-6990 MS Thesis in your PoS.
- Must publicly present master’s thesis research, with Committee (3 ECSE faculty) sign off (even if also pursing a PhD).
- Academic Advisor = Research Advisor.
Master of Science w/o Thesis

- New this year. Replaces MEng
- Does not focus on research.
- Semesters to complete: 2 possible w/ heavy load; 3 semesters more typical.
- Max time period 2.5 yrs (Grad School Policy).
- Professional / Master’s Project an option but not typical (need a voluntary Advisor for this).
- Academic Advisor = an ECSE Faculty or GPD.
Co-Terminal MEng

Identical to MEng, except:

- PoS must reflect completion by end of Year 5 (that is, 1 AY after your normal 4-Year BS).
- ECSE strongly recommends at least 6 Master’s PoS credits by end of Year 4!
- Co-terminal students must complete all BS requirements and graduate within 8 semesters, at which point their status will change to graduate.
- Academic Advisor = Undergraduate Advisor.
Co-Terminal MS w/o Thesis

Identical to MS w/o Thesis, except:

- PoS must reflect completion by end of Year 5 (that is, 1 AY after your normal 4-Year BS).
- ECSE strongly recommends at least 6 Master’s PoS credits by end of Year 4!
- Co-terminal students must complete all BS requirements and graduate within 8 semesters, at which point their status will change to graduate.
- Academic Advisor = Undergraduate Advisor.
Co-Terminal MS with thesis

Identical to MS, except:

- Need an existing Research Advisor, who fully endorses PoS Completion by end of Year 5 (1 AY after your normal 4-Year BS).
- ECSE strongly recommends at least 6 Non-Thesis Master’s PoS credits by end of Year 4!
- Co-terminal students must complete all BS requirements and graduate within 8 semesters, at which point their status will change to graduate.
- Academic Advisor = Research Advisor.
Masters Program Meeting

- Continue in JEC 3117, following this meeting (10.45am scheduled)
- There are more rules for these Master’s degrees which affect your registration for this Fall semester and your plan of study.
- We will review these rules and go into detail on completing your Plan of Study, so that you can register correctly this week.
Questions?