ECSE Graduate Programs

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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

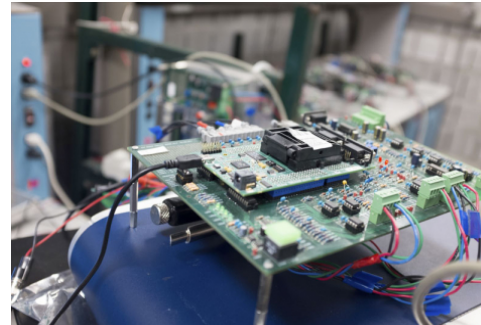https://www.ecse.rpi.edu/research
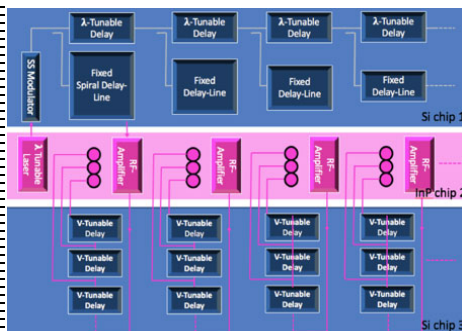

AI and Machine Learning Systems
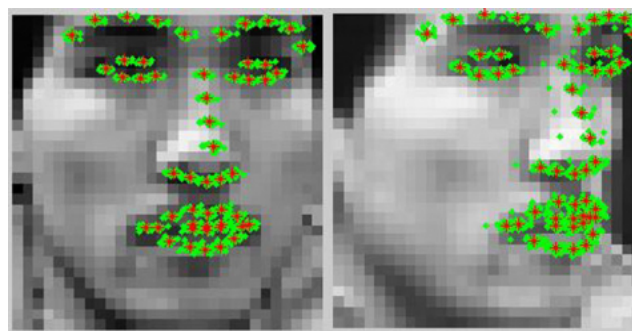

Communications & Computer Networking

Computer Hardware Design

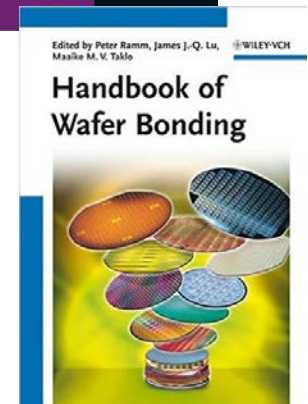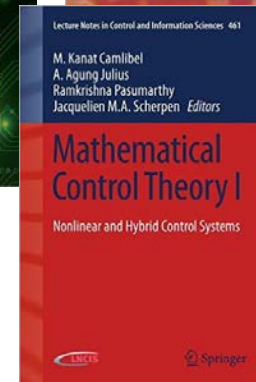Controls, Robotics, and Automation

Electronics & Photonics

Imaging Science & Computer Vision

Power Electronics & Power Systems

World Renowned Scholars
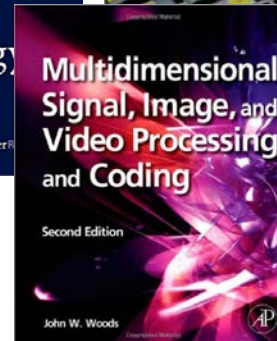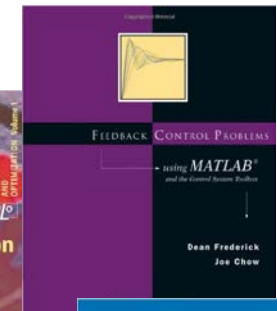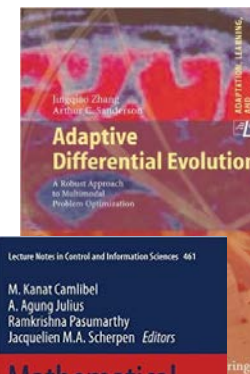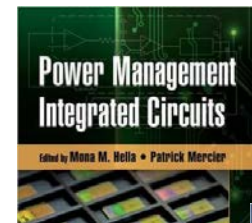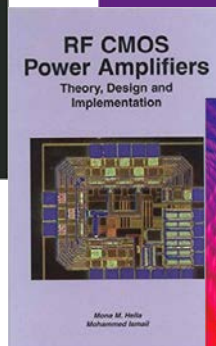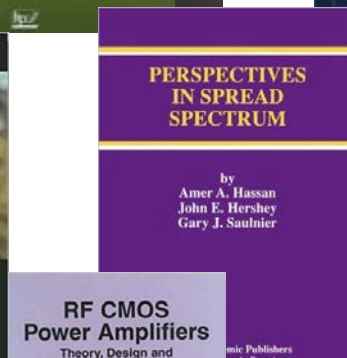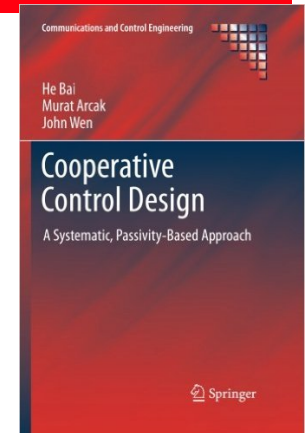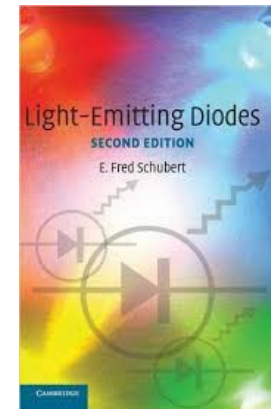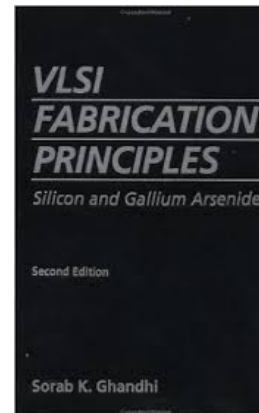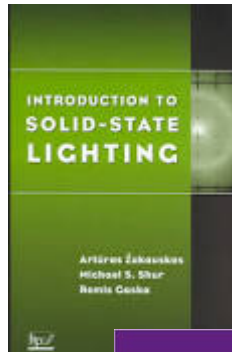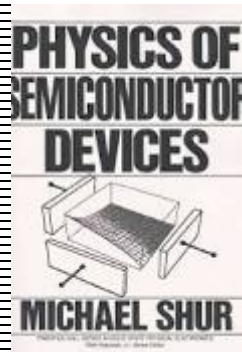
ECSE Graduate Programs

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)

Rensselaer
ECSE

- 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 27th JEC 6309 at 1:00 p.m. Attendance is required.
        - In JEC, room number 63XX means 6th floor, 3rd side corridor.
        - 60XX would be in the main corridor.

Are You Properly Registered?

(Essential if you want to be a TA/RA <u>and</u> 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 <u>by noon on Tuesday</u>.
  - Prof. Lu uses this information to ensure your TA assignment does not conflict with your course schedule.
  - Assignments will be sent via email.

Registration Requirements

Master's (excluding Co-Term) and Doctoral:
- Full-time status15 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

  - RPI Web Page

- 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 <u>DQE</u> in 2nd semester if admitted with Masters, in 3rd semester if admitted with only BS.

3. Form <u>Doctoral Committee</u>.

4. Pass <u>DCE</u> in 4th semester of doctoral study.

5. Complete <u>Thesis</u> and pass <u>Defense</u>, with appropriate Committee sign off.

DQE

ECSE

- 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 Parts</u>:

  - <u>4 Oral Exams</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>: 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

PhD continued

- ◆ 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 continued

- ◆ 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.

- ◆ <u>Academic Advisor = Research Advisor</u>.

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.

Doctoral Requirements 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.

◆ 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.

Doctoral Requirements continued

- ◆ 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

ECSE Master's Programs

August 26, 2019 *ECSE Grad Orientation* *30*
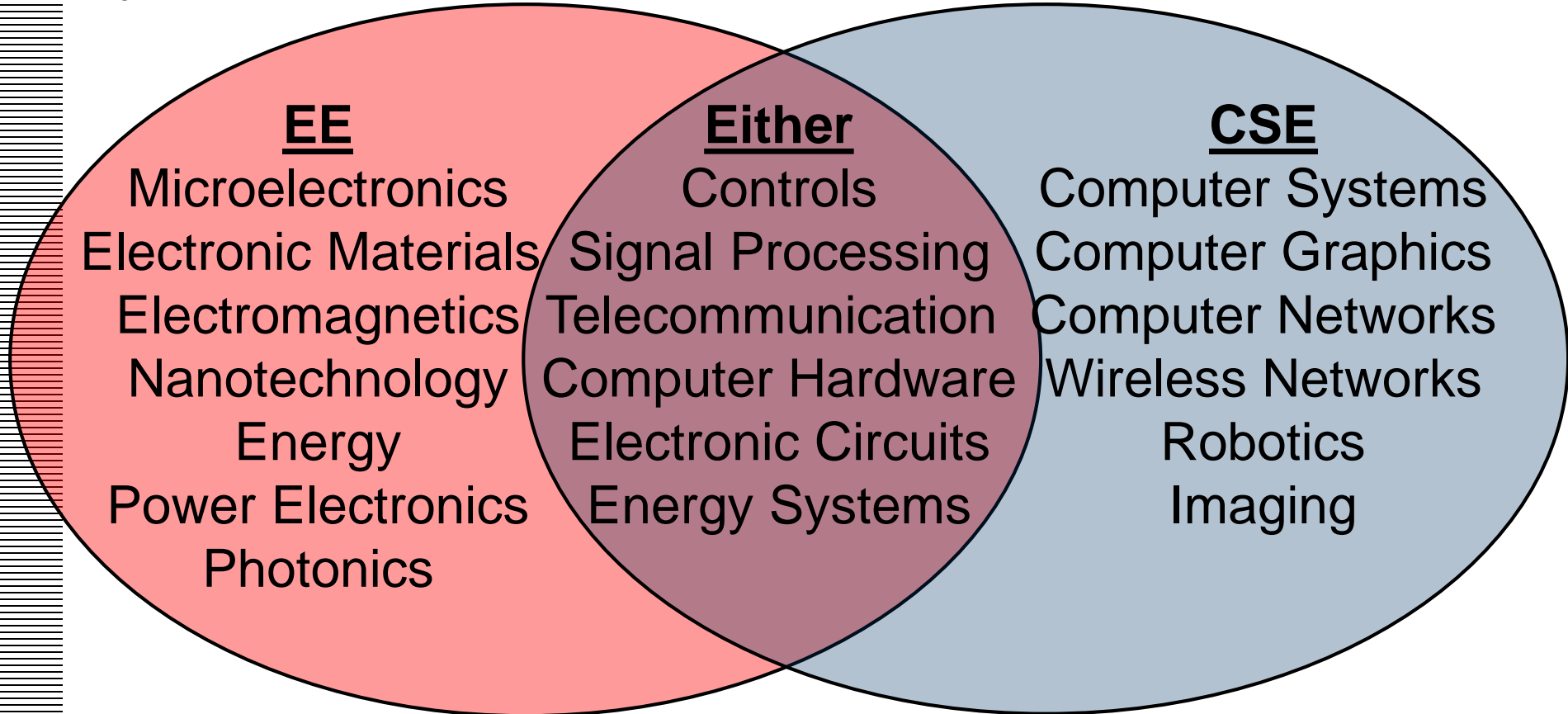
ECSE Master's Degrees

- ◆ 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	**Either**	**CSE**
Microelectronics	Controls	Computer Systems
Electronic Materials	Signal Processing	Computer Graphics
Electromagnetics	Telecommunication	Computer Networks
Nanotechnology	Computer Hardware	Wireless Networks
Energy	Electronic Circuits	Robotics
Power Electronics	Energy Systems	Imaging
Photonics		

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 <u>voluntary</u> Advisor for this).

- ◆ <u>Academic Advisor = an ECSE Faculty or GPD.</u>

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 <u>Project</u> an option but not typical (need a <u>voluntary</u> Advisor for this).

- <u>Academic Advisor = an ECSE Faculty or GPD.</u>

Co-Terminal MEng

Identical to MEng, except:

- PoS must reflect <u>completion</u> by end of <u>Year 5</u> (that is, 1 AY after your normal 4-Year BS).

- ECSE strongly recommends at least <u>6 Master's PoS credits by end of Year 4</u>!

- Co-terminal students must complete all BS requirements and graduate within 8 semesters, at which point their status will change to graduate.

- <u>Academic Advisor = Undergraduate Advisor</u>.

Co-Terminal MS w/o Thesis

Identical to MS w/o Thesis, except:

◆ PoS must reflect <u>completion</u> by end of <u>Year 5</u> (that is, 1 AY after your normal 4-Year BS).

◆ ECSE strongly recommends at least <u>6 Master's PoS credits by end of Year 4</u>!

◆ Co-terminal students must complete all BS requirements and graduate within 8 semesters, at which point their status will change to graduate.

◆ <u>Academic Advisor = Undergraduate Advisor</u>.

Co-Terminal MS with thesis

Identical to MS, except:

◆ Need an <u>existing</u> Research Advisor, who <u>fully</u> endorses PoS Completion by end of <u>Year 5</u> (1 AY after your normal 4-Year BS).

◆ ECSE strongly recommends at least <u>6 Non-Thesis Master's PoS credits by end of Year 4</u>!

◆ Co-terminal students must complete all BS requirements and graduate within 8 semesters, at which point their status will change to graduate.

◆ <u>Academic Advisor = Research Advisor</u>.

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?