Welcome!

1st Year M.S. Student Orientation
Fall 2018
Professor Charles Roth
Agenda

• Introductions
• Curriculum
• Thesis adviser selection
• M.S. to Ph.D.
• Teaching opportunities
• Academic integrity
• Support
• Math Assessment Test
Degree Requirements – Thesis Option

• 24 credits coursework
  – 5 core courses
    • Analy Methods (Engineering math)
    • Adv Transport I (Fluids)
    • Adv Thermo
    • Adv Transport II (Mass transport)
    • Kinetics and Reactor Design
  – 3 electives
    • Encouraged to take 1 “broadening” elective (explained later)
    • 155:601/602 Graduate Seminar (at least 2 semesters)
  – Must maintain 3.0 GPA overall with no more than 1 grade less than B in core courses

• 6 credits research
• M.S. thesis and defense

Fall 2018
Spring 2019
Advisor Selection

• You need a thesis advisor to support your studies, providing an intellectual climate and facilities for your research.

• Pizza with the Professors
  – Tuesdays/Fridays, 12:00-1:20, C-115.

• Lab Open House
  – Time/date to be announced

• Go talk to faculty and their students!

• Advisor selection choices due by end of classes in Dec.

• In the end, it is your responsibility to find an advisor. The Department does not guarantee that all students will find research advisors
Faculty Research Areas

Asefa, Chundawat, Celik, Tsilomelekis, Zhang

Energy

Biotechnology & Bioengineering

Pharmaceutical Science and Engineering

Materials

Androulakis, Buettner, Chundawat, Moghe, Pedersen, Roth, Schuster, Zhang

Glasser, Ierapetritou, Muzzio, Ramachandran, Tomassone

Process Systems & Reaction Engineering

Androulakis, Celik, Ierapetritou, Ramachandran

CONTROL (DOTAP/ODN)
Rational design of molecular assembly to engineer cells

Schuster et al., *Nat. Comm.* 2018
# Pizza with Professors

**Fall 2018 CBE Pizza with Professors Research Talks**

*Conference Room C-115*

* Required for Incoming PhD and MS Thesis *

## September 2018

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## October 2018

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• 30 credits coursework
  – 5 core courses
    • Analy Methods (Engineering math)
    • Adv Transport I (Fluids)
    • Adv Thermo
    • Adv Transport II (Mass transport)
    • Kinetics and Reactor Design
  – 5 electives
    • At least 2 must be chemical engineering electives (offered in our department)
    • Could take 5 Pharm. Eng. Electives (Pharm. Eng. Option)
    • Allowed/encouraged to take 1 “broadening” elective (e.g. business)
    • Internship credits (155:611/612) allowed
    • Can do 3 credits of research as “Special Problems” 155:588/589
  – Must maintain 3.0 GPA overall with no more than 1 grade less than B in core courses
Internship Credits

• A new experience in industry that utilizes and expands chemical engineering skills
• Can qualify for 155:611/612 Internship course
  – Must apply using Request for Internship form
  – Credits are for completing course assignments, not just for doing the internship
• Up to 3 credits per semester (or summer)
  – Up to 6 count toward non-thesis degree
  – Up to 3 count toward thesis degree
• International students can take an internship under CPT
  – Restrictions apply
Broadening Elective

- Research/independent study
  - Work on a one-term project under the guidance of a faculty mentor

- Industrial internship
  - Hands-on experience related to chemical engineering in industry
  - Note: we do not have pre-arranged internships available
  - However, at least 22 graduate students had industrial internships this summer (20 Master’s)

- Business courses
  - Many in Business in Science program or Business School
  - See electives list published or available

- Pedagogy course
  - For Learning Assistants, provides background and tools for working with students
M.S. to Ph.D.

• The M.S. is considered a terminal degree

• Occasionally, a research project is going well and there is an opportunity for conversion to Ph.D., but this is not the norm

• If there may be an opportunity, application is made during the second year for entrance at conclusion of second year
  – Academic performance
  – Adviser’s recommendation

• All Ph.D. students are required to pass a Qualifying Exam based on core chemical engineering knowledge and ability to read/interpret a journal paper
Teaching Opportunities

• Learning Assistants
  – mostly undergraduates, but Master’s students used in Process Eng. Lab and Senior Design
  – Take a formal pedagogy course
  – Help out in class/lab

• Graders
  – Limited availability; grade papers

• Teaching Assistants
  – Ph.D. students only

• Instructional Assistants
  – Required teaching component of Ph.D. degree
Graduate Students May Never:

- Quote or paraphrase without complete citations;
- Cite a source that has been identified through a secondary source but has not been consulted;
- Copy from the internet;
- Collaborate with others without explicit permission from instructor;
- Use unauthorized materials during an examination or on an assignment;
- Look at or copy the work of another student during an exam;
- Submit the work completed in one class to fulfill the requirements of a second class without the consent of the instructor.
Sanctions for a given violation may be imposed differently on those with more or with less experience as students. Thus violations of academic integrity by graduate students\(^2\) will normally be penalized more severely than the same violations by inexperienced undergraduate students. In particular, violations that would be considered nonseparable for an undergraduate student may be treated as separable for a graduate student.”

Consequences

- Disciplinary Probation
- Failure in the course
- Loss of Financial Support
- Suspension of Student Status
- Removal from Rutgers
Graduate Students as Researchers must adhere to the ethical codes of their discipline/profession and cannot:

- Falsify/fabricate or selectively withhold data or results;
- Misuse or appropriate the data of others;
- Present data in a sloppy or deceptive manner;
- Fail to maintain accurate laboratory notebooks;
- Fail to credit all authors and contributors appropriately;
- Sabotage/appropriate the research of another;
- Misuse research funds or institutional property for personal use;
- Develop inappropriate relationships for personal gain;
- Fail to comply with Federal Guidelines for the treatment of human or animal subjects.
Support at Rutgers

- Graduate Program Administrative Assistant
  - Lynn DeCaprio, lynny@rci.rutgers.edu, 5-2228

- Graduate Program Director
  - Charlie Roth, cmroth@rutgers.edu, 5-6686

- Graduate School-New Brunswick staff
  - Associate Dean Barbara Bender, bbender@rutgers.edu, 2-7747

- CAPS: Rutgers Counseling, ADAP (alcohol and other drug assistance program) and Psychiatric Services
  - See brochure, contact tel:732-932-7884
Math Assessment (155:507)

- Math course is taught in two sections
- Assessment quiz will be given on first day of class to determine section
  - All students should report to BME-102 (auditorium) and be seated by 5:00 PM sharp!
- Main topics: linear algebra, functions and series, ODEs
- You may like to review but don’t fret: you will have an excellent class in either section!
Graduate Student Organization

- Fall BBQ
- Graduate Student Symposium
- PhD recruiting
- Industry presentations
- Social events
Registration – typical

- 155:501 Advanced Transport Phenomena I (3)
- 155:507 Analytical Methods (3)
- 155:511 Advanced Chemical Engineering Thermodynamics (3)
- 155:601 Chemical Engineering Graduate Seminar (optional, primarily for thesis students) (0)

- Total 9 credits
- **Optional**: substitute an elective for a core course (which you would take next year) or add an elective for 12 credits
- **NOTE**: Registration deadline Sept. 3!