Why Apply to UF ChE for your PhD?

Information on Research Opportunities and Program Requirements

Standard admission to the UF ChE PhD Program only occurs for fall semesters
Apply by Dec. 5th of the preceding year for Fall Admission

Questions?
• Email: grad@che.ufl.edu
• Check out the FAQ Page
Why should you apply to UF Chemical Engineering?

- Rigorous chemical engineering curriculum supporting your growth toward research excellence
- Outstanding research infrastructure & access to state-of-the-art centers
- Interdisciplinary research programs for interactions and collaborations across campus
- Diverse, socially & intellectually active student body that supports each other through the PhD program
- Continued support and training focused on ways to ensure your career goals are achieved
Our goal is to prepare students for fruitful and successful careers in many industrial, academic, and government sectors through rigorous scientific and engineering research experiences and curriculum

Our Program:

• Prepares students to be entrepreneurs and business leaders
  • Engages students in technology transfer and offers workshops and courses/graduate certificates on business development and planning
  • Prepares students to be leaders in industry with graduate certificates in engineering leadership
    • Collaboratory for women innovators
    • Assistance in finding graduate internships with industry partners
  • Offers courses and training on instrumentation and equipment necessary for future employment

• Prepares students for academic careers
  • Passport to Great Teaching graduate certificates to prepare for academic careers
  • Department of Engineering Education courses and training opportunities
  • Mock Interviews for PhD program alumni

• Encourages a sense of community through GRACE (Graduate Association of Chemical Engineers)
  • Support from the Gator Nation and a strong alumni network
Application Information:

Priority deadline: **December 5**

- Application fee waivers expire on December 5\textsuperscript{th}
  - [Request fee waiver code here](#)
- Ensure submission by December 15\textsuperscript{th} for full consideration
- GRE is **not required** for any application to the UF ChE PhD Program
- Accepted students are admitted into a cohort each year and advisor selection/project matching occurs during the Fall semester
- Please make sure recommendation letter writers are timely with their recommendation letter submission, but note that these do not need to be in by Dec. 5\textsuperscript{th} and won’t prevent you from using the fee waiver code

More information, including methods to obtaining application fee waivers and detailed Application Preparation Information can be found on [our ChE PhD FAQs Page](#)
Supporting you along your PhD Journey

5 years of guaranteed funding for Ph.D. students making satisfactory progress

- Competitive Graduate Assistant Stipend
  - $30,000+ per year (your salary as a graduate employee)
- Full Tuition
- Health Insurance

Opportunities to win awards during your time in the department and HWCOE that can provide 1-time or continued “bonuses”

- Financial awards to students through HWCOE competitive fellowships
- Departmental awards for receiving external fellowships
- Travel awards for conference attendance
PhD Program Requirements

Specific requirements are outlined in the ChE Graduate Handbook

Highlights from the Handbook

- All PhD students take 24 credits each year
  - 9 in the spring and fall and 6 in the summer
  - Usually, summer credits are research credits, though sometimes graduate electives are offered
- 12 credits of core ChE graduate coursework are required along with registration and participation in Graduate Seminar
  
  ECH 6270  Continuum Basis (graduate transport)
  ECH 6847  Mathematical Basis
  ECH 6272  Molecular Basis (graduate thermodynamics)
  ECH 6506  Chemical Engineering Kinetics or ECH 6526 Reactor Design
PhD Program Requirements
Specific requirements are outlined in the ChE Graduate Handbook

Highlights from the Handbook

Successful graduation from the PhD Program requires the following:

- Passing core ChE graduate classes with a B- or better and completing 90+ credits
- Maintaining a 3.0 GPA
- Passing the Qualifying Exam by the end of your 2nd year (July of second year)
  - Submission of a written proposal outlining the goals for your PhD research in an objective or hypothesis driven manner
  - Oral presentation of the written proposal + examination of your research progress by your PhD committee
- Participation in the Supervised Teaching course (5+ credits)
  - Gain teaching experience under the supervision of one our faculty
  - No traditional Teaching Assistant (TA) requirements
  - Instead, we value helping you learn how to teach without significant time commitment of a traditional TA
- Oral presentation at an AIChE Annual Meeting, GRACE Symposium, or other relevant conference
- Final defense of your dissertation to your committee and submission of the committee-approved written dissertation
Assignment of PhD Advisor and Project Selection Process

PhD project matching and advisor selection occurs in the first semester (fall) of the graduate program

*Admission to the program and advisor selection are two completely separate processes*

**Timeline:**

**Late August: Overview of Research Projects and Opportunities**
- Each faculty member presents available research project(s)
- Goal is to introduce new PhD students to the available projects

**August, September, and October: Meetings, Discussions, and Tours of Research and Office Space**
- New PhD students meet with at least 3-5 faculty members to discuss details of available projects
- Students learn about mentoring styles, attend group meetings, and read relevant papers
- Students meet with current PhD students to learn about the environment and group culture
- Students participate in the annual Fall GRACE Symposium to learn about on-going research efforts

**Early November: Advisor Matching**
- Students submit their ranking of projects to the Graduate Program Associate Chair
- Faculty convene to match students to available projects and advisors
- Announcements made before Thanksgiving break
UF Chemical Engineering Primary Faculty – 28 and Growing!
We have excellent staff support to assist in our smooth and efficient function!

Sharla Alexander  Amanda Bolcar  Claudette Coleman  Victor De La Cruz  Kaitlynn Gravely  Dana Harpe

Janice Harris  Shirley Kelly  Randall Ledkins  Emily López  Sherri McLeran  Michelle Runyon

Cynthia Sain  Deborah Sandoval  David Sante  Shaura Thomas  Preston Towns  Ricky Whitney
UF ChE Research Areas

Advanced Materials, Devices, and Nanotechnology
Choi, Hagelin-Weaver, Hages, Hibbitts, Jain, Jang, Jiang, Orazem, Ren, Rinaldi, Sampath, Stoppel, Ziegler

Biomolecular Engineering, Cellular Engineering, and Synthetic Biology
Chu, Denard, Dickinson, Jain, Jang, Orazem, Ren, Rinaldi, Sampath, Stoppel, Svoronos

Complex and Multiphase Flow Dynamics
Butler, Chu, Kopelevich, Ladd, Narayanan

Energy, Environment, and Sustainability
Choi, Chu, Crisalle, Hagelin-Weaver, Hages, Hibbitts, Jiang, Orazem, Sampath, Svoronos, Vasenkov, Weaver, Ziegler

Heterogeneous Catalysis and Surface Science
Hagelin-Weaver, Hibbitts, Weaver

Modeling, Theory, and Simulation
Chu, Hibbitts, Kopelevich, Ladd, Narayanan, Orazem, Sampath, Svoronos

Transport, Electrochemistry, and Thermodynamics
Butler, Choi, Chu, Hages, Kopelevich, Ladd, Narayanan, Orazem, Rinaldi, Vasenkov
Advanced Materials, Devices, and Nanotechnology

We develop fundamental understanding and control over various advanced materials for a spectrum of device and nanotechnology applications ranging from nanoparticle catalysts and magnetic nanoparticles to impedance glucose sensors and next-generation power switches to supramolecular assemblies and interfacial engineering of nanomaterials.
Biomolecular and Cellular Engineering for Human Health

We perform fundamental research and develop technologies for improving human health. Ongoing research includes studies of nanoparticle-biological interactions, cellular mechanics, engineering of proteases and CRISPR-Cas systems, development of new types of sensors and new materials for biomedical applications.
Complex and Multiphase Flow Dynamics

Insights on the dynamics of complex and multiphase fluids through experiments, theoretical analysis, and simulation are generated. A wide range of industries, products, and emerging technologies are being favorably impacted.

Analysis of the rheology and fluid mechanics of viscous suspensions.

Pattern formation and nonlinear dynamics in interfacial processes.

Concentration field in an evolving pore volume. Increasing concentration is shown from blue to red. Fluid flow is from left to right. The initial pore space (left) is increased by the flow of reactive ions (right).

Molecular and multi-scale modeling of soft matter.
We develop fundamental knowledge and technologies to meet an increased demand for energy with minimal environmental impact. Examples of current focus areas include development of active and selective catalysts, advancing new strategies in membrane-based separations, and introduction of next-generation semiconductors for energy research.

Ethane dehydrogenation on the IrO$_2$(110) surface

C-O bond rupture over nickel phosphide catalysts

Changing gas transport in MOF crystals by confining these crystals in polymers to form hybrid membranes

Holistic energy materials research
Heterogenous Catalysis and Surface Science  
Synthesis and Characterization, Kinetic Studies, and Density Functional Theory

**Heterogeneous Catalysts** are key to mitigating climate change, forging a renewable energy and chemicals industry, and providing a high quality of life throughout the globe without sacrificing our environment. At UF, we study catalysis through a combination of synthesis, characterization, and kinetic studies (Hagelin-Weaver and Hibbitts), surface science studies of interfacial chemistry (Weaver), and density functional theory calculations to give insights into atomistic behavior (Hibbitts).
Modeling, Theory, and Simulation

We develop mathematical theories, AI-based algorithms, and computational simulations across the atomistic, particle, and continuum levels to model chemical engineering processes, with the aims of gaining fundamental scientific knowledge and devising next-generation applications in in-space manufacturing, renewable energy, drug delivery, geological formation, electrochemical impedance spectroscopy, and membrane-based separation.
Transport, Molecular Thermodynamics, and Electrochemical Engineering

We generate insights on the dynamics of complex systems through experiments, theoretical analysis, and simulation. Aims of the research include enabling the efficient control and processing of these systems which are used in a wide range of industries, products, and emerging technologies.

- Suspension dynamics and rheology
- Dynamics of self-assembly
- Instabilities in magma flows
- Transport in nanochannels
- Geochemical instabilities
Research Groups in the department span the spectrum of skills from simulation and modeling to hands-on benchwork.

In some groups, students perform both benchwork and computational work. In other groups, students really focus on one skill over another. For more information, contact the professor or students in their group to get a better idea of the group organization.
Research from the department is published in a variety of academic journals, highlighting the efforts of the research teams!

**Science**

Low-temperature activation of methane on the IrO$_2$(110) surface

Zhu Liang,$^1$ Tao Li,$^1$ Minkyu Kim,$^2$ Aravind Astagiri,$^3$ Jason F. Weaver$^4$*

**Nature Communications**

Enhancement of trans-cleavage activity of Cas12a with engineered crRNA enables amplified nucleic acid detection

Long T. Nguyen, Brianna M. Smith & Ryush K. Jain

**Nano Letters**

Breakdown of the Stokes–Einstein Relation for the Rotational Diffusivity of Polymer Grafted Nanoparticles in Polymer Melts

Lorena Maldonado-Camargo$^1$ and Carlos Rinaldi$^1$,$^2$,$^3$ $^1$Department of Chemical Engineering, University of Florida, P.O. Box 116005, Gainesville, Florida 32603, United States

**Biomacromolecules**

Tuning the Structural Integrity and Mechanical Properties of Globular Protein Vesicles by Blending Crosslinkable and Non-Crosslinkable Building Blocks

Ruwen Tan,$^1$ Jooyong Shin,$^1$ Jiwoong Heo, Blair D. Cole, Jinkee Hong, and Yeongseon Jang$^*$

**ACS Applied Materials & Interfaces**

Controlling the Geometries of Si Nanowires through Tunable Nanosphere Lithography

Luping Li,$^1$ Yin Fang,$^1$ Cheng Xu,$^1$ Yang Zhao,$^1$ Kedi Wu,$^1$ Connor Limburg,$^5$ Peng Jiang$^5$ and Kirk J. Ziegler$^5$,$^6$,$^7$$^1$Department of Chemical Engineering, University of Florida, Gainesville, Florida 32611, United States

**ACS Nano**

Thermal Decomposition Synthesis of Iron Oxide Nanoparticles with Diminished Magnetic Dead Layer by Controlled Addition of Oxygen

Mythrey Ummi,$^1$ Amanda M. Uhl,$^1$ Shehab Sadiq,$^1$ Benjamin H. Szot,$^1$ Rohan Dhavalika,$^5$ Nicolas Gareau,$^5$ David P. Arnold,$^1$ Lena F. Kuiken,$^1$ Jennifer S. Andrews,$^1$ and Carlos Rinaldi$^1$,$^2$,$^3$ $^1$Department of Chemical Engineering, $^2$Department of Materials Science and Engineering, $^3$Institute of Biomedical Microsystems Group, Department of Electrical and Computer Engineering, and $^5$Craytons Pratt Family Department of Biomedical Engineering, University of Florida, Gainesville, Florida 32611, United States

**Soft Matter**

Electro-hydrodynamic concentration of genomic length DNA†

Mert Arca, Anthony J. C. Ladd$^*$ and Jason E. Butler$^*$
PhD Students are recognized for their efforts via external and internal awards

Victor Rivera-Llabres
NSF Graduate Research Program (NSF GRFP) Fellowship Recipient

Calen Leverant
2020 Attributes of a Gator Engineer Integrity Award Winner

Nevin Brosius
NASA NDSEG Graduate Research Fellowship Recipient

Julie F. Jameson
2020 Attributes of a Gator Engineer Leadership Award Winner
GRACE is a graduate student group that was created to foster relationships between the student body and department.

Highlight of each Fall Semester: Annual GRACE Symposium

Current UF ChE PhD, MS, and undergraduate students to share their research with the department

- Oral and poster presentations by interested students
- Awards for presenting students at all levels
- Opportunity to receive feedback from UF ChE faculty prior to presenting at AIChE or other venues
- Great occasion to showcase efforts and interact with alumni
GRaduate Association of Chemical Engineers (GRACE)

GRACE hosts several events throughout the school year: trips to the local springs, research socials, tailgates, and celebrations!

Social Activities

- Diwaloween = Diwali + Halloween
- Habitat for Humanity Outreach Events

New PhD Student Mentoring Program

Incoming PhD students are paired with more-senior PhD students

- Primary contacts for any questions, academic and non-academic
- Make the department more cohesive
- Encourage and support participation in GRACE and department events
PhD Students from UF ChE are employed across the globe!
Chemical Engineering Buildings and Facilities

**Chemical Engineering Building**
- Houses most faculty offices and some research labs
- 3-story unit operations laboratory
- Advanced Chem-Bio Laboratory Space
- Conference rooms
- Copy room
- Classrooms
- Faculty and student mailboxes
- PhD student office spaces

**Chemical Engineering Student Center**
- Funded 100% by Alumni donations
- Designed by students and faculty
- Multiple study and collaboration spaces
- Vast, multi-story atrium for social events
- Academic advising suite
- CHE Administration offices
Wertheim Laboratory for Engineering Excellence

- 21,000 sq. ft. of collaborative research space
- $3.8M in new research equipment for PhD student use
- Interdisciplinary research floor with open bench spaces and grad student offices
- Wertheim Engineers’ Biotech Organization (WEBiO) organizes interdisciplinary social, research, and professional development activities in the building

Chemical Engineering Research Groups in Wertheim Building:
Whitney Stoppel
Piyush Jain
Carl Denard
Easy WALKING access to state-of-the-art facilities!

We are proud to offer PhD students the opportunity to learn how to use multi-million $$ equipment.

Equipment is managed by PhD level scientists and engineers who offer weekly trainings, brown bag learning lunches, webinars, and other professional development opportunities.

Students can easily navigate collaborative efforts across campus without even getting in the car.

https://rsc.aux.eng.ufl.edu/
We hope you are excited to apply to be a UF ChE PhD Student!

We will provide you with

- An intellectually stimulating environment
- Challenging problems along with the knowledge and tools to solve them
- Professional ethics to guide you through your career
- International cultural and professional experience to widen your perspective

We will expect from you

- Serious intellectual commitment
- Excellence in learning and leadership in research
- Dedication and hard work
- Big dreams and a desire to grow during your time at UF

Questions?
Email: grad@che.ufl.edu
How can we help you become a PhD Student in Chemical Engineering at the University of Florida?

Email grad@che.ufl.edu with your questions and check out our FAQ Page

https://www.gainesville.com/entertainment/20161227/7-gainesville-area-springs-to-enjoy-year-round

https://www.floridamuseum.ufl.edu/
https://harn.ufl.edu/
https://performingarts.ufl.edu/
https://goo.gl/maps/QRouALmWdmVvsrZF7

https://floridagators.com/sports/2015/12/10/_students_.aspx
https://thefestfl.com/
https://goo.gl/maps/8w5F41gfptG4EzG8