Welcome to Chemical & Biomolecular Engineering
What is Chemical Engineering?

- Combines chemistry, biology, physics, & mathematics
- Focuses on the engineering & processing of materials, from synthesis through purification to end use
- Earning a BS degree in Chemical Engineering will prepare you for a wide variety of career options.

“One thing that makes chemical engineering great is that there are so many things you can do with this degree. The options are almost limitless.”

– Stephen Finley, ’07
Careers in Chemical Engineering

Commodity and Specialty Chemicals

Energy

Electronic & Advanced Materials

Environmental Sustainability
Careers in Chemical Engineering

Biotechnology

Food

Pharmaceuticals
Careers in Chemical Engineering

Medicine

Law

Business

Research

Academia
Recent Job Stats for Clemson B.S. ChEs

- 80% entered full time employment
  
  Average starting salary: $70,000
  (range $55,000-$105,000)

- 20% continued academic preparation with graduate work in engineering, medicine, or law
Advanced Career Opportunities

PhD: Usually required for research/development or university teaching

Recent Clemson grads have chosen to continue their studies at some of the following Universities:

- MIT
- Georgia Tech
- Northwestern
- UC Berkeley
- Clemson
- NC State
- University of Texas
- University of Florida
- University of Virginia

Masters Degree: Can be used to become more specialized in a related field such as Business, Biomedical Engineering, Environmental Engineering, or other specialized disciplines. A Masters Degree is not required before a PhD.
Advanced Career Opportunities

📍 Professional Degrees:

📍 Medical (MUSC, UNC-Chapel Hill, Columbia U, USC)
📍 Dental (Columbia U, MUSC)
📍 Veterinary (UGA)
📍 Law (USC, Columbia U, UGA)

📍 Master’s in Business Administration (MBA): usually of more value if you get a few years of industry experience first.

📍 Professional Engineer (PE) – certification based on 5 years experience and a professional exam.
Career Path Forecast

Chemical Engineers (ChEs) are expected to see employment growth for the foreseeable future (US Dept. of Labor, Bureau of Labor Statistics).

Larger growth opportunities are expected in research and development, particularly in energy, biotechnology, and nanotechnology (Sloan Career Cornerstone Center).

Energy, specialty chemicals, and pharmaceuticals are likely to offer the best manufacturing opportunities for ChEs (Sloan Career Cornerstone Center).
Chemical & Biomolecular Engineering at Clemson

- All courses & labs are located in Earle Hall
- We occupy all of Earle Hall

We are...
- 302 Undergraduates (sophomore, junior, senior)
- 54 Grad students
- 20 Faculty & Staff
- 1 big, happy family
The Curriculum-ChE

**Freshman Year**
- General Engineering
- Chemistry
- Calculus
- Physics
- Intro to Chemical Engineering

**Junior Year**
- Physical Chemistry
- Basic Electrical Engineering
- Statistics
- Thermodynamics II
- Separations
- Biomolecular Engineering
- Unit Operations Lab I
- Engineering Materials
- Emphasis Area

**Sophomore Year**
- Organic Chemistry
- Multivariable Calculus
- Differential Equations
- Physics
- Mass & Energy Balances
- Thermodynamics I
- Fluids/Heat Transfer

**Senior Year**
- Reaction Engineering
- Unit Operations Lab II
- Senior Process Design
- Safety Environmental and Professional Practice
- Process Controls
- Bioprocess Engineering
- Emphasis Area

***Please see our web site for a list of all courses in the curriculum***
The Curriculum-Biomolecular Concentration

Freshman Year
- General Engineering
- Chemistry
- Calculus
- Physics
- Intro to Chemical Engineering

Junior Year
- Biomaterials
- Biochemistry
- Thermodynamics
- Separations/Mass Transfer
- Biomolecular Engineering
- Unit Operations Lab I
- Engineering Materials
- Physics
- Statistics

Sophomore Year
- Organic Chemistry
- Multivariable Calculus
- Biology
- Mass & Energy Balances
- Thermodynamics I
- Fluids/Heat Transfer

Senior Year
- Reaction Engineering
- Unit Operations Lab II
- Senior Process Design
- Safety Environmental and Professional Practice
- Process Controls
- Bioprocess Engineering
- Physical Biochemistry

***Please see our web site for a list of all courses in the curriculum***
**Curriculum Emphasis Areas**

- **Biomolecular Engineering**
  - Concentration with the modified curriculum previously shown
  - Students receive a B.S. in ChE with a concentration in Biomolecular Engineering

- **Environmental Engineering and Science**

- **Polymeric Materials**

- **Business Management**

- **Energy Studies**

- **Applied Engineering, Mathematics, Science**

- **Completion of almost any minor at Clemson**
Educational Enrichment: Co-op

36% of ChBE undergraduates co-op and 49% do an internship

- Ascend
- BASF
- Michelin
- Dority & Manning (Attorneys)
- Dow Chemical
- Eastman Chemical
- Exxon
- GE
- Kimberly-Clark
- Milliken
- Shaw
- ...many Others

The Co-op Program is managed through Clemson’s Michelin Career Center (#1 Career Center according to the Princeton Review 2016)
Educational Enrichment: Research

About 58% of ChBE undergraduates participate in research

- **Departmental Research**
  - Advanced Materials
  - Biofuels
  - Biological Separations
  - Biomaterials
  - Molecular Modeling and Simulation
  - Polymer Science and Engineering
  - Protein & Drug Delivery
  - Kinetics and Catalysis
  - Supercritical Fluids
  - Surface Engineering/Science
  - Nanomaterials

- **Cross-Departmental Research**
- **Creative Inquiries**
- **Summer REU Programs**
- **Departmental Honors**
Get Involved Locally! - AIChe

Clemson has an active Student Chapter of the American Institute of Chemical Engineers (AIChe)

✱ Mentor Mentee Program
✱ Industry Visits and Meetings
✱ Social Events
✱ National Conferences
Get Involved Abroad!

- Department Study Abroad Program: Unit Operations II Lab in Copenhagen, Denmark
  - Summer before Senior Year
  - 4 week program
- Engineers Without Borders
- Other study abroad opportunities are coordinated through the CECAS
Department Contacts

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See our website for more information:
www.clemson.edu/chbe