

AS-T BIO/CHEM E/MRP

## Bioengineering & Chemical Pre-Engineering

Complete basic background studies for transfer to a bachelor's degree program in engineering disciplines. Careers may be found in research, development, design, operations management, teaching, sales and consulting.

For a roadmap that identifies the preferred sequencing of courses and other specific recommendations from faculty, please see the corresponding program map(s):

- **Bioengineering and Chemical Pre-Engineering AS-T (Chemical Option) ( [lowercolumbia.edu/program-maps/stem/AST-Bioengineering-and-Chemical-Pre-Engineering-Chemical-Option](http://lowercolumbia.edu/program-maps/stem/AST-Bioengineering-and-Chemical-Pre-Engineering-Chemical-Option) )**
- **Bioengineering and Chemical Pre-Engineering AS-T (Bioengineering Option) ( [lowercolumbia.edu/program-maps/stem/AST-Bioengineering-and-Chemical-Pre-Engineering-Bioengineering-Option](http://lowercolumbia.edu/program-maps/stem/AST-Bioengineering-and-Chemical-Pre-Engineering-Bioengineering-Option) )**

### Degree Requirements

- **Communications:**  
5 credits - ENGL& 101 English Composition I.
- **Quantitative / Symbolic Reasoning Skills:**  
20 credits – MATH& 151\* Calculus I, MATH& 152\* Calculus II, MATH& 153\* Calculus III, AND MATH 240 Differential Equations.
- **Humanities/ Social Sciences:**  
15 credits – minimum 5 credits in Humanities, minimum 5 credits in Social Science, plus an additional 5 credits in either Humanities or Social Science from the Distribution List. ECON& 201 or 202 recommended.
- **Diversity:**  
5 credits – from the Diversity Course List. Courses that meet this requirement may also be used toward other graduation requirements. Diversity courses are listed in the quarterly schedule and identified by 'DIV' attached to the course title. Example: SOC& 101 – Introduction to Sociology:DIV.
- **Electives:**  
5 credits minimum – select electives with the help of an advisor based on the requirements of the specific discipline at the baccalaureate institution the student plans to attend.

### Pre-Major Requirements (40 credits)

CHEM& 161*	General Chemistry w/Lab I	5
CHEM& 162*	General Chemistry w/Lab II	5
CHEM& 163*	General Chemistry w/Lab III	5
CHEM& 261*	Organic Chemistry w/Lab I	5
BIOL& 221*	Majors Ecology/Evolution: w/Lab <i>OR</i> Organic Chemistry w/Lab II	5
CHEM& 262*		
PHYS& 221*	Engr Physics I w/Lab	5
PHYS& 222*	Engr Physics II w/Lab	5
PHYS& 223*	Engr Physics III w/Lab	5

### Electives

BIOL& 221*	Majors Ecology/Evolution: w/Lab	5
BIOL& 222*	Majors Cell/Molecular: w/Lab	5
CHEM& 262*	Organic Chemistry w/Lab II	5
CHEM& 263*	Organic Chemistry w/Lab III	5
CS 170	Computer Programming	5
ENGL& 235	Technical Writing	5

ENGR& 204	Electrical Circuits	6
ENGR& 224	Thermodynamics	5
MATH& 254* (was MATH 154)	Calculus IV	5
MATH 220	Linear Algebra	5

**Diversity and Distribution Lists ( [lowercolumbia.edu/publications/catalog/distribution-lists](http://lowercolumbia.edu/publications/catalog/distribution-lists) )** are available in the Lower Columbia College Catalog located at [lowercolumbia.edu/catalog](http://lowercolumbia.edu/catalog).

*Total transferable credits required to earn this degree: 90 with a cumulative grade point average (GPA) of at least 2.0. A course cannot be credited toward more than one distribution or skill area.*

### **Students completing this program should acquire the following skills and abilities:**

- Demonstrate the ability to use foundational knowledge in mathematics, physics, chemistry, and biology.
- Design and conduct experiments.
- Make measurements, analyze data, and interpret results.
- Problem solving, team, self-assessment and lifelong learning skills.
- Communicate effectively.

**Revised June 2019 (Effective Fall 2019)**

### **Notes:**

Baccalaureate institutions party to this agreement are: UW Seattle, WSU, EWU, Gonzaga U, St. Martin's U, Seattle Pacific U, Seattle U and Walla Walla U.

Additional general educational requirements, cultural diversity requirements, and foreign language requirements, as required by the receiving institution, must be met prior to the completion of a baccalaureate degree.

Program planning is based on information available at the time of preparation. It is the student's responsibility to meet with their LCC advisor *and* with an advisor at the college to which they plan to transfer for specific requirements. Consult the LCC catalog for LCC graduation requirements.

Most four-year universities require one year of a single foreign language as a graduation requirement.