



## Bioengineering and Chemical Engineering

Associate in Bioengineering and Chemical Engineering  
Major Related Program (MRP)  
Planning Guide 2017–2018

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### Bioengineering and Chemical Engineering—What is it?

Bioengineers and Chemical Engineers integrate their knowledge of natural sciences and engineering to conduct research, design and test equipment, create new medicines and develop procedures for the advancement of health care, public safety, environmental protection, science and medicine.

**Areas of Study in Bioengineering and Chemical Engineering:** Calculus, Biology, Chemistry, Physics, Electronic Circuits, Thermodynamics, Mechanics of Materials, Genetics, Bioinformatics, Epidemiology, Engineering Problem Solving, Project Design, Manufacturing Processes, Medical Procedures, Project Management, Computer Applications, Safety, Quality Control, Research Methods, Statistical Analysis and Professional Ethics.

### What is an AS-T Track 2 MRP?

The Associate in Science Transfer (AS-T) Track 2, Major Related Program is designed to prepare students entrance into a Bachelor of Science (B.S.) program in Bioengineering or Chemical Engineering. The MRP details the required foundation courses for students to be prepared for junior standing at baccalaureate institutions. Students will be required to take additional general education courses after transfer. Engineering is also an excellent major for graduate studies in Environmental Sciences, Law, Medicine, Business and Education.

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### Where can I go for help?

#### Instructional Faculty Advisors

<b>Alison Armstrong</b>	206-546-4698	<a href="mailto:aarmstrong3@shoreline.edu">aarmstrong3@shoreline.edu</a>	Rm. 2810
<b>Eric Basham</b>	206-546-4625	<a href="mailto:ebasham@shoreline.edu">ebasham@shoreline.edu</a>	Rm. 2809
<b>David Phippen</b>	206-546-4572	<a href="mailto:dhippen@shoreline.edu">dhippen@shoreline.edu</a>	Rm. 2817
<b>Tiffany Meier</b>	206-546-6953	<a href="mailto:tmeier@shoreline.edu">tmeier@shoreline.edu</a>	Rm. 5233

#### For course information and entry codes, contact:

[engineeringadvising@shoreline.edu](mailto:engineeringadvising@shoreline.edu)  
[chemistryadvising@shoreline.edu](mailto:chemistryadvising@shoreline.edu)  
[mathadvising@shoreline.edu](mailto:mathadvising@shoreline.edu)  
[biologyadvising@shoreline.edu](mailto:biologyadvising@shoreline.edu)

#### General Academic Advising

FOSS (5000) Building, Rm. 5229  
206-546-4559: [advising@shoreline.edu](mailto:advising@shoreline.edu)  
[www.shoreline.edu/advising](http://www.shoreline.edu/advising)

#### International Student Academic Advising

9000 Building, Rm. 9302  
206-546-4697  
[leadvisors@shoreline.edu](mailto:leadvisors@shoreline.edu)  
[www.shoreline.edu/international/advising/](http://www.shoreline.edu/international/advising/)

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### Where can I transfer?

The AS-T Track 2 MRP in Bioengineering and Chemical Engineering makes it possible for students to transfer to a number of public and private colleges and universities with junior standing. Below are Washington state institutions that recognize this MRP.

University of Washington (BE, CHE,)  
Washington State University (BE, CHE)  
Walla Walla University (BE)

\*Note: Engineering majors offered at Washington state universities are designated as follows: Bioengineering (BE) and Chemical Engineering (CHE)

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### What can I do with a Bachelor's Degree in Bio and Chemical Engineering?

Bio and Chemical Engineers develop strong critical thinking, problem solving and communication skills to apply their knowledge of science and engineering to a wide range of careers, including product design and testing, research and development, project management, teaching, sales and consulting.

**Potential employers include:** Engineering firms, manufacturing companies, pharmaceutical companies, chemical manufacturers, biotechnology companies, hospitals, medical equipment companies, government agencies, colleges and universities and consulting firms. For more, please visit <http://www.shoreline.edu/counseling-services/career-counseling.aspx>

**What do I need to take?\***

Below are the requirements for the AS-T Track 2 and the Major Related Program (MRP) in Bioengineering and Chemical Engineering.

I. GENERAL EDUCATION I 18 - 20 Credits			
Courses used in General Education (Gen Ed) Core may not be used for distribution.			
General Education Courses	QTR	GR	CR
ENGL &101			5
ENGL &102 or &230, or CMST &101			3 - 5
Multicultural Understanding			5
MATH &151 (Quant. & Symb Reas.)			5

II. DISTRIBUTION REQUIREMENTS   10 Credits				
See courses listed on next page <i>ECON &amp;201 recommended for Social Sciences</i>				
Humanities	5 Credits	QTR	GR	CR
1.				
Social Sciences	5 Credits	QTR	GR	CR
1.				

**III. PRE-MAJOR PROGRAM I 78 – 80 Credits**

PHYSICS   16.5 Credits	QTR	GR	CR
PHYS &221 <i>Fall, Win</i>			5.5
PHYS &222 <i>Win, Spr, Sum</i>			5.5
PHYS &223 <i>Win, Spr</i>			5.5
CHEMISTRY   26.5 Credits	QTR	GR	CR
CHEM 171/181 <i>Every quarter</i>			6.5
CHEM 172/182 <i>Win, Spr, Sum</i>			6.5
CHEM 173/183 <i>Fall, Spr, Sum</i>			6.5
CHEM &241/271 <i>Fall, Win</i>			7
ADDITIONAL CHEM/BIOL   5–7 Credits			
CHEM &242/272 ( <i>Win, Spr</i> ) –or– BIOL &211 ( <i>Every Quarter</i> )	QTR	GR	CR
1.			

MATHEMATICS   15 Credits	QTR	GR	CR
MATH &152 <i>Every quarter</i>			
MATH &163 <i>Every quarter</i>			
MATH 207 <i>Fall, Spr</i>			

<b>FOR MAJOR ELECTIVE COURSES, CHOOSE FROM LIST BELOW</b> BIOL &211 (if not taken above); BIOL &212 ( <i>Win, Spr</i> ); CHEM &242/272 (if not taken above); CS &141 ( <i>Every quarter</i> ); ENGL &230 ( <i>Fall, Spr</i> - if not taken above); ENGR &204 ( <i>Win</i> ); ENGR &214 ( <i>Spr, Fall</i> ); ENGR 240 ( <i>Win</i> ); MATH 208 ( <i>Fall, Win</i> ); MATH &264 ( <i>Spr</i> )			
MAJOR ELECTIVE COURSES   15 Credits	QTR	GR	CR
1.			
2.			
3.			

**What does your chosen four-year school require?**

Before choosing classes, become familiar with the four-year program where you want to apply: visit the website, email the department, and/or speak with a Shoreline advisor. Below are examples from Washington schools with different admissions and graduation requirements. Check with the school for world language requirements. (Non-native speakers of English are often exempt from this requirement.)

School	Degrees	Requirements
University of Washington	B.S. in Bioengineering; Chemical Engineering with an option in Nanoscience, Molecular Engineering; and Bioresource Science and Engineering.	Note that UW Departments of Bioengineering and Chemical Engineering admit only once a year for Spring Quarter and that admission is very competitive. <a href="http://tinyurl.com/mltbehd">http://tinyurl.com/mltbehd</a>
Walla Walla University	B.S. in Bioengineering.	Walla Walla University is a private university affiliated with the Seventh Day Adventists. Students will be required to take religious studies courses after transfer. <a href="http://tinyurl.com/mlww3rm">http://tinyurl.com/mlww3rm</a>
Washington State University	B.S. in Bioengineering; Chemical Engineering (Pullman)	In addition to core math, science and engineering courses, WSU requires ECON& 201 to graduate. A 2.0 or better grade in all engineering and major prerequisite courses is required. <a href="http://tinyurl.com/n3etplc">http://tinyurl.com/n3etplc</a>

The following is a list of classes that satisfy Shoreline's 2017-2018 AS-T Track 2 degree requirements. Credits for a specific course may be used only once and may not be applied toward more than one distribution area. Course numbers with an "&" are common course numbers with content that is consistent across Washington state community colleges.

**I. GENERAL EDUCATION CORE REQUIREMENTS | 18-20 CREDITS**

<b>COMMUNICATIONS</b> —8-10 Credits	<b>MULTICULTURAL UNDERSTANDING</b> — 5 Credits	<b>QUANTITATIVE / SYMBOLIC REASONING</b> —5 Credits
English &101 English &102, &230 Communication Studies &101	Art 105 Communication Studies 203, 285 Gender and Women’s Studies 284 History 245 Multicultural Studies 105	Math &151

\* Students planning to transfer to the University of Washington must consult Math Advising, [mathadvising@shoreline.edu](mailto:mathadvising@shoreline.edu)

**II. DISTRIBUTION AREA REQUIREMENTS | 10 CREDITS**

**HUMANITIES**—5 Credits  
No more than 5 credits in 100 level foreign language.

General Humanities

- American Ethnic Studies 106, 215
- American Sign Language &121-&123
- Art &100, 105, 234
- Art History 204, 210, 224-226
- Chinese &121-&123
- Cinema 201, 202
- Communication Studies &101, &102, 203, &210, &220, 285
- Drama &101
- English &111-&113, 154, 200, 207, &220, &226-&228, 229, &244-&246, 247, 248, 257, 265, 271, 272, 281, 282, 287-289
- French &121-&123
- Honors 100
- Humanities 111-113, 140, 275
- Japanese &121-&123, &221-&223
- Music 100, &105, 106, 108, 109, &141-&143, 150, 206, 224, &241-&243
- Philosophy &101, 102, &115, 210, 240, 248, 267
- Spanish &121-&123, &221-&223

Performance Skills /Applied Theory – 5 Credits Maximum

- Art 109, 110, 121-123, 131-134, 144-146, 251-256, 260-262, 271-273
- Communication Studies 140, &230, 244, 245, 247, 292-294
- Drama 144–146, 155-157, 207–209, 224-226, 234. 235, 244, 246, 255, 293
- English &230, 279
- Film 255-258, 266, 285, 286, 290, 292-295
- Music 114, 115, 118–120, 135, 136, 140, 144, 146, 147, 151–156, 161–167, 170, 175, 180, 184, 196, 204, 205, 207, 210-212, 225, 226, 251–253, 264, 268, 270, 280, 284, 296
- VCT 267

**SOCIAL SCIENCES**— 5 Credits

- American Ethnic Studies 106, 119
- Anthropology &100, 130, 140, &204, &206, &207, 215
- Business &101
- Child Advocacy Studies 102, 202, 285
- Communication Studies &102
- East Asia 216, 218
- Economics 100, &201, &202. 291-295
- Gender and Women’s Studies 205, 215, 284-286, 288
- Geography &100, 123, &200, 277, 295
- History &116-&118, &136, &137, &146-&148, 207, &214, &215, 218, &219, 234-238, 245-247, 275, 295
- Honors 100
- International Studies 101, 123, 200, 201, 205, 292, 295
- Multicultural Studies 105, 205, 210, 238, 250
- Philosophy &101, 102, &115, 210, 240, 248, 265, 267, 295
- Political Science &101, &201-&203, 221, 222, 291-295
- Psychology &100, &200, 208-210, &220, 225, 236, 245, 295
- Sociology &101, 102, 112, &201, 202, 250, 288, 295

**STUDENT INFORMATION**

Name: \_\_\_\_\_  
 Student I.D. No.: \_\_\_\_\_  
 Major/Pathway(s): \_\_\_\_\_  
 Specialty (if applicable): \_\_\_\_\_

**TRANSFER SCHOOLS OF INTEREST**

- 1.
- 2.
- 3.
- 4.

**Academic Goals**

- Complete an A.A. or A.S. degree
- Prepare for transfer only—No degree
- High school completion program/ GED

**Previous College Experience**

- Transferred from another college
- Completed transfer credit evaluation
- Prior Learning Assessment

Qtr:	Year:
COURSE	CR
Total Credits	

Qtr:	Year:
COURSE	CR
Total Credits	

Qtr:	Year:
COURSE	CR
Total Credits	

Qtr:	Year:
COURSE	CR
Total Credits	

Notes:

Qtr:	Year:
COURSE	CR
Total Credits	

Qtr:	Year:
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Qtr:	Year:
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Qtr:	Year:
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Notes:

Qtr:	Year:
COURSE	CR
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Qtr:	Year:
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Total Credits	

Qtr:	Year:
COURSE	CR
Total Credits	

Qtr:	Year:
COURSE	CR
Total Credits	

Notes: