

**Bioengineering, Chemical Engr, Bioresource Sci & Engr, and Plastics & Composites
Engineering Program Requirements**

1-Jan-22

Course #	Description	TCC	TCC	UW			WSU		WWU
		AS-BioE/ChemE	AS-T2	Seattle			Pullman		Bellingham
		MRP		BioE	ChemE	BSE	BioE	ChemE	PCE
Math& 151, 152	Calculus 1, 2	R	R	√-app	√-app	√-app	√	√	√
Math& 153	Calculus 3	R	S	√-app	√-app	√-app	G	G	A
Math& 254	Calculus 4	S	S	√-app	√-app	√-app	G	G	
Math 238	Differential Equations	R	S	G	√-app	√-Fall	G	G	A
Math 220	Linear Algebra	S	S	√-Fall	√-Fall	G	G	G	A
Phys& 221	Calc Based Physics 1	R	R	√-app	√-app	√-app	G	G	√
Phys& 222	Calc Based Physics 2	R	R	√-enr	√-app	√-app	G	G	G
Phys& 223	Calc Based Physics 3	R	R	A	√-Fall	G	G	G	G
Not at TCC	Biochemistry	S	S						G
Chem& 161	General Chemistry 1	R	R	√-app	√-app	√-app	√	√	√
Chem& 162	General Chemistry 2	R	S	√-app	√-app	√-app	√	√	√
Chem& 163	General Chemistry 3	R	S	√-app	√-app	√-app	G	G	see note
Chem& 261	Organic Chem 1	R	S	√-enr	√-Fall	√-Fall	A	G	
Chem& 262	Organic Chem 2	S (R B221 or C262)	S		√-Fall	G	A	G	
Chem& 263	Organic Chem 3		S				A	G	
Biol& 221	Evolution, Ecology & Biodiv	S (R B221 or C262)	S	√-enr		Gen	A		
Biol& 222	Cellular & Molecular	S	S	G		Gen	G	G	A
Biol& 223	Bio of Organisms		S	G		Gen	A		
Engr& 104 ¹	Intro to Design	S or Soc	S	Gen	Gen	Gen	G		√
Engr& 114	SolidWorks/Graphics	Hum	S	A		A			
Engr 170	Intro to Material Sci	S	S	A	A	A	A	A	√
Engr& 204	Electric Circuits	S	S		A	A	G	A	
Engr& 214	Statics		S	A	A	A	G		√
Engr& 215	Dynamics		S	A	A	A	A		
Engr& 224	Thermodynamics	S	S		P	√-Fall	A	A	
Engr& 225	Mechanics of Materials		S	A	A	A			G
Engr 240	Applied Numerical Methods	S	S	√-enr	√-Fall				
Not at TCC	Chemical Process, Principles and Calculations	S	S						
CS 142	Java 1	S	S		ENGR 240 pref	A			G
Engl& 101	English Composition 1	R	S	√-app	√-app	√-app	G	G	G
Engl& 235	Technical Writing	S	S		G	G		G	
Hum and Soc Sci ¹		R	R	Gen	Gen	Gen	Gen	Gen	Gen

TCC Key:

There are two relevant associate's degrees: 1) AS-Bioengineering and Chemical Engineering - MRP degree, and 2) AS-T2. More info on back.

R = Required for the AS-MRP degree. The AS-T2 also requires completion of a minimum of 32 additional advisor-approved college level credits.

S = Specialization Course - Minimum of 4 courses for AS-BioE/ChemE-MRP. One of these must be either Biol& 221 or Chem& 262. May also be used for AS-T2.

University Key:

√ = Required for admission or certification to the department. For Fall admission at UW (BSE), √-app class must be completed by April 5 and √-enr by fall start at UW. For Spring admission at UW (BioE, ChemE, BSE), √-app class must be completed by Jan 15 (for ChemE up to 2 can be in progress during winter quarter). √-enr by Spring start at UW. √-Fall: for all students, course must be completed prior to fall of junior year.

G = Graduation requirement for the Bachelor of Science at the university. These are freshman/sophomore level courses so take now, if possible.

A = Meets an additional requirement. The university requires the selection of additional classes from specific lists for the BS.

Gen = May be used as general education credit within the university BS degree.

P = Provides preparation for junior level university coursework and/or for the FE/EIT exam, the first step to being licensed.

Additional notes

¹ Economics is recommended. Engr& 104 counts as either a Specialization course or a Social Science, but not both. Engr& 114 counts as a Humanities. The AS degrees require 15 credits of Humanities and Social Science. At least 5 credits must be a Humanities and 5 credits must be a Social Science. One class must meet the multicultural requirement. See approved lists. Universities may have specific course Humanities/Social Science/Diversity course requirements.

Bioengineering, Chemical Engr, Biomass Resource Sci & Engr, and Plastics & Composites Engineering Program Requirements

Tacoma Community College

Students should generally be working toward one of three associate's degrees: 1) the Associate of Science -Bioengineering and Chemical Engineering - Major Related Program (AS-CE/ME - MRP), 2) the Associate of Science- Track 2 (AS-T2), and/or 3) the Associate of Arts DTA (AA-DTA). It is important to understand the distinctions. Most Bioengineering, Chemical Engineering and Biomass Resource Science and Engineering students should be working toward the AS-BioE/ChemE -MRP, since it was developed to closely match university engineering program coursework. It requires 98-99 credits, rather than 90, which can be helpful with financial aid. **Most Plastics and Composites students should be working toward the AS-T2.** The AS-T2 is less restrictive. Students can make more self-advising errors using this model; however, if you are ready to transfer and a few classes shy of the AS-BioE/ChemE-MRP degree, you might still be eligible for the AS-T2 (speak with an engineering advisor). The AA-DTA degree is intended for students to complete their general education requirements and is usually a poor fit for engineering students. Some universities give specific benefits for one or more of these degrees. Although we occasionally advise transferring without a degree, please transfer courses back to complete the degree. TCC funding is tied to associate's degree completion, so you help future students by finishing your degree. You may earn more than one degree from TCC, but must have an additional 30 credits for each degree.

University of Washington - Seattle

You must apply to both the university and the major. The Bioengineering and Chemical Engineering departments only admit students in spring quarter. The Bioresource Science & Engr department admits spring and autumn. Spring quarter deadlines are Dec. 15 for the university and Jan. 15 for the departments. Fall quarter deadlines are Feb. 15 for the university and April 5 for the departments. (There may be other deadlines for international students.) Some classes must be completed before you apply (v-app) although ChemE allows up to 2 to be in progress at the time of application. Some courses must be completed before you start in the program (v-enr). University of Washington requires core requirements from high school. This applies even if high school was years ago! High school is considered to start in 9th grade. The core requirements are 4 years of English, 3 years of math, 3 years of social science, 2 years of foreign language, 2 years of lab science, and 0.5 years of art. If you did not complete these in high school, the requirements can be met through TCC courses. In general, 1 year of high school class = 5 credits of college work. See the University of Washington website for more details.

The UW Bioengineering department and Chemical Engineering departments both offer an option in Nano & Molecular Engineering. The full biology sequence (221, 222, 223) should be taken at the community college for transfer equivalency to the UW's biology sequence for Bioengineering. The UW Bioresource Science and Engineering program was formerly known as the Paper Science and Engineering program. It is small, targeted program. In the past, there have been a number of scholarships for this program.

Washington State University - Pullman

WSU gives advantages to completing the AS-MRP degree. Individual departments have specific requirements, so while a social science may transfer, if you don't choose carefully, you may also have to take another class to meet the requirement. Choose the following courses: HIST& 128 (World Civ 3) and ECON& 202 (Macro). Completion of the AS-T degree (WA) automatically satisfies UCORE WRTG, QUAN, BSCI, PSCI, and three of the following requirements: HUM, SSCI, ARTS, DIVR, ROOTS. Up to three additional lower-division UCORE must be satisfied via transfer credit or in-residence credit prior to completion of a baccalaureate degree, and an individual course completed within the AS-T degree may not satisfy more than one UCORE category. WSU requires a writing portfolio. Save samples of graded written work from TCC. WSU is on the semester system, rather than the quarter system. They require application to the university, followed by direct admission into the program. See university website for important deadlines. The Chemical Engineering program at WSU generally offers ChE 201 (covering Material and Energy Balances) during the summer and fall semesters. This class is a pre-requisite for fall semester junior year Chemical Engineering courses and Bioengineering Spring semester courses. At WSU, it is taught during the sophomore year, but is not offered at any CC. It is offered in the late summer session so students can finish spring quarter at a CC and complete it before fall semester starts at WSU. It is a great way to transition between TCC and WSU (<http://www.summer.wsu.edu/>). Students planning to complete the WSU Chemical Engineering BS degree in 2 years after transferring to WSU need to take CHE 201 in the summer at WSU. Otherwise, three years will be required to complete the BS Chemical Engineering degree.

The Bioengineering program has both a general and a pre-med option. ChE 201 (covering Material and Energy Balances) is required as a prerequisite for fall semester junior year Chemical Engineering courses and Bioengineering Spring semester courses. The Chemical Engineering program at WSU generally offers ChE 201 during the summer and fall semesters. It is a sophomore-level course that is not offered at any CC. Students can transition to WSU's bioengineering program either by taking ChE 201 in the summer semester or in the fall semester. Completing this course in the summer a great way to transition between TCC and WSU (<http://www.summer.wsu.edu/>). For students planning to complete the WSU Bioengineering BS degree in 2 years after transferring to WSU, they need to have taken statics at their CC or during the summer at WSU (this is a pre-requisite for one of the fall junior-level Bioengineering courses). They should also be prepared to take circuits (EE 261) in the fall semester. Otherwise, three years will be required to complete the BS Bioengineering degree.

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Western Washington University

WWU's Plastics Engineering Technology (PET) program has been replaced by a Plastics and Composites Engineering (PCE) program. Apply for admission to the program for spring of WWW PCE does not require Chem 163, but this class is a prereq for TCC's Chem 261.

It is the student's responsibility to check university websites and meet with university advisors to ensure the accuracy of advising information.