

# Mechanical and Aeronautical/Astronautical Engineering Program Requirements

Revised Oct. 3, 2019

Course #	Description	TCC AS-MRP	UW		WSU			EWU	Seattle U	St. Martins	SPU	Gonzaga	
			Seattle		Bothell	Pullman, Everett Bremerton	TriCities	Vancouver	Cheney	Seattle	Lacey	Seattle	Spokane
			ME	A/A	ME	ME	ME	ME	ME	ME	ME	GenE (ME)	ME
Math& 151, 152, 153	Calculus 1, 2, 3	R	√-app	√-app	√	√	√	G	G	G	G	G	
Math& 254	Calculus 4	S	√-app	√-app	√	√	G	√	G	G	G	G	
Math 238	Differential Equations	R	G	√-enr	√	√	G	G	G	G	G	G	
Math 220	Linear Algebra	R	G	√-enr		√	G	√		G	G	P	
Phys& 221	Calc Based Physics 1	R	√-app	√-app	√	√	√	√	G	G	G	G	
Phys& 222	Calc Based Physics 2	R	√-app	√-app	√	√	√	√	G	G	G	G	
Phys& 223	Calc Based Physics 3	R	G	√-enr	G	√	G	G	G	G	G	G	
Chem& 161	General Chem 1	R	√-app	√-app	√	√	√	√	G	G	G	G	
Chem& 162	General Chem 2	R	√-enr	G		√	√	√		G			
Engr& 104	Intro to Design	S or Soc <sup>1</sup>	A	A		G <sup>4</sup>	G	G		G			
Engr& 114	SolidWorks/Graphics	S or Hum <sup>1</sup>	G		G	√	G	G	G	G	G (GE103)	G	
Engr 170	Intro to Material Sci	NA	G		G	G	G		G		A	G	
Engr& 204	Electric Circuits	S	G	P		G <sup>4</sup>	G	G	G	P		G	
Engr& 214	Statics	R	√-app	√-app	√	√	√	√	G	G	G	G	
Engr& 215	Dynamics	R	√-enr	√-enr	√	√	G	√	G	G	G	G	
Engr& 224	Thermodynamics	S	P	√-enr		G	G	G	G	P	P	G	
Engr& 225	Mech of Materials	R	√-enr	√-enr	√	√	G	√	G	G	G	G	
Engr 240	App Numerical Methods	S	G	G		√ <sup>4</sup>	G	G	G	P		G (or 142)	
CS 142	Java 1	S				Engr 240 Pref		Engr 240 Pref				G (or 240)	
Engl& 101	English Comp 1	R	√-app	√-app	√	√	G	G	G	G	G	A	
Engl& 235	Technical Writing	S	G	P		G		G			G 102 <sup>2</sup>	G 103 <sup>3</sup>	
Hum and Soc Sci <sup>1</sup>		R	A - see back	A - see back	A - see back	A - see back	A - see back	A - see back	A - see back	A - see back	A - see back	A - see back	

## TCC Key:

There are two relevant Associate's degrees. The AS-Mechanical/Civil/Aero/Ind/MSE - MRP degree and the AS-T2. More info on back.

**R** = Required for the Associate of Science 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-MRP. Minimum of 32 college level credits for AS-T2

## University Key:

√ = Required for admission or certification to the department. For UW, √-app class must be completed by April 5. √-enr by Fall start at UW.

**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.

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

## Additional notes

<sup>1</sup> Engr 104 is a Social Science. Engr 114 may count as either Specialization course or as a Humanities, but not both. The AS degree requires 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 course requirements.

<sup>2</sup> SMU requires English 102 instead of English 235. English 102 may be substituted for 235 in the AS degree.

<sup>3</sup> GU requires English 103 instead of English 235. English 103 may be substituted for 235 in the AS degree.

<sup>4</sup> Engr 104 will be waived by WSU if student transfers with 60+ credits. Numerical Methods is preferred to computer programming. Electric Circuits must have lab.

# Mechanical and Aeronautical/Astronautical Engineering Program Requirements

## Tacoma Community College

Students should generally be working toward one of three associate's degrees: 1) the Associate of Science - Major Related Program for Mechanical/Civil (AS-MRP), 2) the Associate of Science- Track 2 (AS-T2), and/or 3) the Associate of Arts DTA (AA-DTA). The AS-MRP was developed on the state level to most closely mirror the coursework that a student would be taking at a university engineering program. In general, most Mechanical/Aero students should be working toward the AS-MRP. If you are a few courses shy of the MRP, talk to an engineering advisor; you may be eligible for an AS-T2. The AA-DTA degree is intended for students to complete their general education requirements and is usually a poor fit for engineering students since it does not allow them to take all of the required prerequisites. Some universities give specific benefits for one or more of these degrees. Although we advise transferring without a degree in some instances, transferring courses back to complete the degree is requested. 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. TCC strongly encourages economics courses for engineering students.

## University of Washington - Seattle

You must apply to both the university and the major. The Mechanical and Aero/Astro departments only admits students in fall quarter. The transfer student application deadline for the University of Washington (fall quarter start) is February 15. (There may be other deadlines for international students.) The application deadline for the department is April 5. Some classes must be completed before you apply (v-app). Some courses must be completed before you start in the fall (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.

## Washington State University - Pullman, Bremerton, Everett

In addition to the program at the main Pullman campus, WSU has junior/senior year programs at Bremerton and Everett. These are ABET accredited as part of the main campus. WSU Bremerton and Everett students must take all v classes, Engr& 204 and either Engr 240 (preferred) or a computer programming course with equivalency to WSU's Cpts 121 or 131. (Note: While TCC's Engr& 204 and Engr 240 have equivalencies for WSU's EE 261 and 262, and EE 221 respectively, this is not the case for all community colleges. If you took them elsewhere, be careful about equivalency with WSU). 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). Chem& 161 and 162 will satisfy the chemistry requirement for ME only if the full year engineering physics sequence is completed at the community college. WSU requires a writing portfolio so save three samples of graded written work from TCC. Download forms from the WSU website and ask your instructors to sign them. Do it as you are taking classes rather than having to go back and ask instructors to evaluate your work again. WSU is on the semester system rather than the quarter system. They require application to the university followed by certification into the program. See university website for important deadlines.

## Washington State University - TriCities

WSU-TriCities is separately ABET accredited. Choose the following courses: HIST& 128 (World Civ 3), and either ECON& 201 (Micro) or ECON& 202 (Macro). Chem& 161 and 162 will satisfy the chemistry requirement for ME only if the full year engineering physics sequence is completed at the community college. Although TCC's ENGR 240 (Applied Numerical Methods) transfers to other WSU campuses as EE 221, this articulation is still in progress with WSU-TriCities. Talk to a WSU advisor.

## Washington State University - Vancouver

WSU-Vancouver is separately ABET accredited. In Mechanical Engineering, students can customize their study through four option areas: (1) Micro/nanotechnology; (2) Design and Manufacturing; (3) Mechatronics (robotics and automation); (4) Renewable Energy. Choose the following courses: HIST& 128 (World Civ 3), and either ECON& 201 (Micro) or ECON& 202 (Macro). Chem& 161 and 162 will satisfy the chemistry requirement for ME only if the full year engineering physics sequence is completed at the community college. ENGR 240 would transfer to WSU Vancouver as the equivalent course to MECH 251 Numerical Computing, a required course for the program.

## University of Washington - Bothell

UW-Bothell is separately ABET accredited. The ME program admits new students twice a year, for Autumn and Winter quarters.

## Eastern Washington University

EWU has engineering programs, as well as a number of technology programs. Acceptance to the major is automatic once accepted to the University. EWU gives advantages to completing the AS degree. Students who complete the AS do not need to take 15 credits of the required 25 credits in the General Education Core requirements. All courses designated as Humanities and Social Sciences by TCC will be accepted as Humanities and Social Sciences by EWU, regardless of individual course transferability. No biological sciences, or macro/micro economics courses are required for graduation.

## Seattle University

Seattle University is a private Catholic (Jesuit) university and the Mechanical Engineering program is ABET accredited since 1962. Transfer student priority application deadline is March 1 for Fall Quarter and scholarships are available. Students can begin their studies at Seattle U also in winter and spring quarters. Obtaining an AS-T2 degree is beneficial since it may reduce the number of CORE courses required for graduation to as few as 3. At least one course each in humanities, social science, and doing art (or creative writing) is highly recommended to maximize the benefit.

## Saint Martin's University

SMU is a private Catholic (Benedictine) university. SMU recommends completion of the AA-DTA while simultaneously working on the AS-MRP or AS-T2 so that General Education requirements are met as well as department requirements. You may apply courses to both degrees, but will have to take 30 additional credits to complete both. Take ENGL& 102 instead of ENGL& 235. You may substitute 102 for 235 in the AS degree. Many classes require minimum of C for transfer.

## Seattle Pacific University

SPU is a private Christian university. If you have earned, prior to matriculation at SPU, an AS-T2, you will be required to take only two of the three required University Foundations courses, UFDN 3001 Christian Scriptures and UFDN 3100 Christian Theology. SPU's BSME degree is new (2018-19), it is not yet ABET accredited; however, the BSME degree requirements are identical to SPU's General Engineering degree with the Mechanical Concentration, which is ABET accredited. So, SPU students can double major in both the BSME and the GEGR-ME to get the BSME, which is not yet accredited, and simultaneously earn the GEGR-ME, which is ABET accredited.

## Gonzaga University

Gonzaga is a private Catholic (Jesuit) university. Take ENGL 103; PHIL& 101, 106, 215 & elective; CMST& 101 & MATH 210 while at TCC. One Java (CS 142) class is accepted.

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