

Proposals for the UW's 2019-21 State Operating Budget Request - Template

The University of Washington carefully selects its biennial state operating budget requests through a consultative process. To submit a proposal for consideration by UW leadership, faculty and students, please complete this template and send it to Becka Johnson Poppe (jbecka@uw.edu) by **April 13, 2018**. Units are not required or expected to submit proposals; however, unless a proposal is submitted through this process and selected for inclusion in the UW's final submission to the state, it will not be part of the UW's official legislative agenda. Should your proposal be one of a small number that is selected to be part of the UW's formal budget submission, you will be notified directly by the Office of Planning & Budgeting (OPB) and asked to help finalize the request to the state. Feel free to reach out to Becka Johnson Poppe or Jed Bradley (jedbrad@uw.edu) if you have questions about the process or about what may be appropriate to submit.

Please avoid jargon and spell out all acronyms. Bullet points are encouraged rather than extensive prose.

Examples of prior state funding proposals are available on pages 37-138 of the UW's [2017-19 Operating Budget Request](#) and pages 3-19 of the UW's [2018 Supplemental Operating Budget Request](#).

Contact Information

Unit Name(s): *Please name the campus/college/school/administrative unit(s) making the request.*

UW Tacoma, Institute of Technology (School of Engineering & Technology after 9/15/2018)

Contact Person(s): *Please provide a name and email address for the most appropriate contact(s) if questions arise.*

Raj Katti, Dean, Institute of Technology: rajkatti@uw.edu

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Request Overview

Proposal Name: *Please provide a short title that can be used to reference this proposal (e.g. Latino Health Center)*

BS programs in Mechanical Engineering (BSME) and Civil Engineering (BSCE) at UW Tacoma

Short Summary: *In 60 words or fewer, please summarize your proposal, highlighting what the funds would buy and what value would be added or what problem would be solved. For example, "Request would buy 3 FTE staff to: expand academic coaching services from 100 students to 350+ students, increase library hours by 2 hours per day, and increase the number of students using career services. This will address growing student service needs, as identified in a student survey, and expand strategies proven to improve retention and graduation rates."*

Start strong and distinctive BSME and BSCE programs (12.0 FTE faculty and 3.0 FTE staff) with steady-state total combined enrollments of 180 (juniors & seniors) to meet the high demand from across the state but designed specifically to meet the needs of local and regional students (transfers and first-time-in-college) and industry partners.

Requested State Operating Funds: *In the table below, please enter the amount of new state operating funding requested for this proposal in the next **four** years (now required by the state). Please do **not** build in inflation or salary increase assumptions.*

Note: Funds requested are cumulative (total funds needed to operate in each fiscal year) and have been reduced by expected tuition revenue.

Fund Type	FY20	FY21	FY22	FY23
State General Fund ¹	\$177,000	\$1,634,000	\$1,808,000	\$1,791,000
FTE totals ²	1.0	12.75	14.0	15.0

Description

In 500 words or fewer, please describe your proposal. This description should allow UW leadership, stakeholders and the legislature to understand the nature of the proposal, including what is driving it and why it is important to address. More details will be requested later in this template. Please make sure to give a high-level overview of:

- *What problem, opportunity, or priority this request would address; and*
- *What the requested funding would “buy” (e.g. faculty, staff, equipment, etc.).*

We propose to start strong and distinctive BSME and BSCE programs at UW Tacoma that will address the following:

- High demand for these programs from across the state. The programs will be designed also to meet needs of local and regional students and industry (see item 1 below).
- The legislature-approved pre-design for a new UW Tacoma Academic Building assumes that it will house new high-demand engineering disciplines.
- Boeing (especially manufacturing operations in the South Sound), the Port of Tacoma, the Naval Undersea Warfare Center, and many other South Sound manufacturing companies (including Globe Manufacturing, Milgard Manufacturing, Jesse Engineering) desire a BSME major with manufacturing emphasis at UW Tacoma.
- Local organizations and companies including the City of Tacoma, Puyallup Tribe, Nisqually Tribe, Tacoma Public Utilities, Pierce County, Port of Tacoma, GeoEngineers, and AHBL desire a BSCE major with urban infrastructure engineering emphasis at UW Tacoma.
- The proposed programs, providing 180 seats, will improve social and economic mobility of the students in these majors and increase the number of STEM majors produced in Pierce County (especially STEM degrees awarded to military veterans).
- Other options for students wanting to study these majors in the South Sound are not sufficient (see item 2 below).
- The programs will strengthen STEM pathways from regional community colleges, whose students mostly stay in the region for baccalaureate education, as shown in the [Washington Pathways Project](#).

The requested funding (at full build-out in FY23) would buy:

- 12 FTE engineering faculty
- 3 FTE staff including (2 Lab Techs, 1 Advisor, 1200 hours per year of student facilitators and tutors)
- Library acquisitions in engineering
- Professional development for faculty and staff

1. Student and Industry Demand:

The [Washington Pathways Project](https://education.uw.edu/washingtonpathways) (https://education.uw.edu/washingtonpathways) shows that the vast majority of transfer students and a significant proportion of high school graduates attend the nearest public university campus.

¹ If you are seeking funding from a state account other than the State General Fund (e.g. from the state biotoxin account), please modify this cell to reflect the name of the account. Note, most state operating budget requests are for the State General Fund.

² Please show total full time equivalent (FTEs) employees and identify in more detail in the “Base Budget and Request Details” section below.

Around 600 students are enrolled in the Associate of Science engineering degree in local community colleges including Tacoma Community College, Pierce College, Green River College, and Highline College. More than half of those students are interested in completing a four-year degree in mechanical engineering (ME) or civil engineering (CE), if given the opportunity locally. Transfer students from these schools perform well in UW Tacoma Institute of Technology programs. Many of the 8,000 Tacoma-area high school students attend schools that emphasize science, technology, engineering and math (STEM) disciplines—including Tacoma Public Schools’ Science and Math Institute (SAMI) with enrollment of 459 in 2015 and the Technology Access Foundation Academy in Kent—and many of these students are interested in engineering majors.

A supply and demand analysis of jobs in ME and CE (Washington Pathways Project 2015) shows that there are about 630 more jobs annually than the number of BSME and BSCE degrees produced in King, Snohomish, and Pierce Counties (this gap is 1,848 in all of Washington). 2016 U.S. Bureau of Labor Statistics (BLS) data show that there are about 910 jobs for ME majors and 1,490 jobs for CE majors in the Tacoma area. Statewide, there are 7,750 jobs for ME majors and 11,270 jobs for CE majors but the state only produces 859 graduates (2015 data) in these fields per year. The job outlook projection (annual % increase in jobs) for the period 2016-26 is 9% for ME and 11% for CE (BLS).

2. Other Options for Engineering Programs are Not Sufficient:

The only BSME and BSCE programs in the South Sound area are at St. Martin’s University (Lacey, Wash.) and via a collaboration between Washington State University and Olympic College in Bremerton. The WSU/Olympic Bremerton program is small and is a transfer-only program that does not satisfy the needs of high school students interested in a four-year engineering program. The St. Martin’s University program is small and very expensive.

Base Budget and Request Details

Please provide narrative in response to the following prompts, and limit your responses to 300 words per question:

If the proposal is an expansion or alteration of a current program or service, what is the current budget? *This is a new question being posed by OFM. It is to provide a sense of scale and to put the request in context. Please briefly describe the current program or service’s total revenue from each fund source and the current total FTEs by fund and activity (or provide working models or backup materials containing this information).*

The budget for the 2017-19 biennium for the UW Tacoma Institute of Technology is \$10,380,053. The Institute offers four undergraduate degrees (BS Computer Science and Systems, BS Computer Engineering and Systems, BS Electrical Engineering, BS Information Technology) and two graduate degrees (MS Computer Science and Systems and Master of Cybersecurity and Leadership (MCL)). The MCL degree is fee-based and its expenses are not covered by the budget for the biennium. There are 810 students enrolled in the Institute of Technology in 2017-18.

What new expenditures and FTEs would the requested funding support? *Please include your best estimates regarding expenditures for personnel, goods, services, travel, etc. Please describe your calculations and any assumptions you are making (for example, assumptions regarding matching funds from private partners, or assumptions regarding new compliance requirements). Please contact Becka Johnson Poppe (jbecka@uw.edu) if you would prefer to provide this information via an Excel template.*

STUDENT FTE DESCRIPTION

This is aimed to build to 90 graduates in engineering industrial sector in our region. The student FTE includes only juniors and seniors.

STUDENT FTE TABLE

Level	# Student FTE By Year and Graduates					
	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
1st Yr FTE						
2nd Yr FTE						
3rd Yr FTE			24	48	80	90
4th Yr FTE				24	48	90
TOTAL STUDENT FTE			24	72	128	180
TOTAL GRADUATES				24	48	90

CASH RECEIPTS DESCRIPTION

Tuition for all students.

CASH RECEIPTS TABLE

Fund Source (e.g. tuition)	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
Average Operating Fee	\$9,798	\$10,082	\$10,374	\$10,696	\$10,696	\$10,696
Net Tuition Revenue (UG)			\$111,000	\$345,000	\$614,000	\$864,000

EXPENDITURES DESCRIPTION

Expenditures are aimed to support the buildout of 90 graduates in mechanical and civil engineering to support the industrial sector in our region.

Expenditures would include:

Faculty and staff salaries: salaries & wages and benefits include hourly staff for 1200 hours per year, \$20.6/hour, starting in FY22

Goods and Services for software licensing and library acquisitions

Contract Services for fixed costs charged by the University

Travel: for faculty to travel to conferences

EXPENDITURES TABLE

Object	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
Salaries & Wages	\$140,000	\$1,284,000	\$1,433,000	\$1,543,000	\$1,838,000	\$1,973,000
Employee Benefits	\$37,000	\$350,000	\$389,000	\$418,000	\$498,000	\$537,000
Goods and Services	\$0	\$0	\$63,000	\$126,000	\$126,000	\$126,000
Contract Services	\$0	\$0	\$13,000	\$26,000	\$26,000	\$26,000
Travel	\$0	\$0	\$21,000	\$23,000	\$29,000	\$31,000
TOTAL	\$177,000	\$1,634,000	\$1,919,000	\$2,136,000	\$2,517,000	\$2,693,000

PROGRAM NEEDS TABLE						
	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
TOTAL TUITION RECEIPTS	\$0	\$0	\$111,000	\$345,000	\$614,000	\$864,000
TOTAL EXPENDITURES	(\$177,000)	(\$1,634,000)	(\$1,919,000)	(\$2,136,000)	(\$2,517,000)	(\$2,693,000)
TOTAL PROGRAM NEED	\$177,000	\$1,634,000	\$1,808,000	\$1,791,000	\$1,903,000	\$1,829,000
TOTAL BIENNIAL NEED		\$1,811,000		\$3,599,000		\$3,732,000
STAFF AND FACULTY FTE DESCRIPTION						
<p><i>This represents the faculty and staff buildout to support 90 mechanical engineering and civil engineering graduates per year for the regional industry. The staff total of 4 FTE includes laboratory, administrative, and advising staff. The total of 16 faculty FTE will be in the fields of mechanical and civil engineering, and math/science.</i></p>						
STAFF AND FACULTY FTE TABLE						
Job Title, Full-Time Salary (including benefits)	# of FTE needed for each job title by year					
	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
Lab Staff, \$70,000	0	2	2	2	2	2
Advising Staff, \$58,000	0	0.75	1	1	1	1
Administrative Staff, \$50,000	0	0	0	0	0.5	1
Full-time Faculty, \$140,000	1	2	2	2	2	2
Full-time Faculty, \$110,000	0	6	7	8	9	10
Full-time Faculty, \$80,000	0	2	2	2	4	4
TOTAL	1	12.75	14	15	18.5	20

Budget Justification:

Faculty Salary: The number of new faculty requested is based on number of courses/sections that need to be taught and emphasis areas needed for electives. The fringe benefits rate for faculty is 26.1%. The salaries below do not include benefits.

Full professor: \$140K

Associate professor: \$125K

Assistant professor: \$110K

Assistant professor – SIAS: \$80K

Full-time lecturer: \$80K

Faculty requested in each year:

Year 1:

1 full professor for mechanical engineering (ME)

Year 2:

3 assistant professors, 1 full-time lecturer (ME)

1 full professor, 3 assistant professors, 1 full-time lecturer for civil engineering (CE)

Year 3:

1 assistant professor for ME

Year 4:

1 assistant professor for CE

Staff Salary: Staff support is based on a dedicated lab support technician and advising for each program. The fringe benefits rate for professional staff is 34.1%. The salaries below do not include benefits.

Lab technician salary: \$70K

Recruiter/advisor; instructional support; UW Tacoma Teaching & Learning Center staff salary: \$58K

Staff requested in each year:

Year 1: No staff

Year 2: 1 lab technician (ME), 1 lab technician (CE), 0.75 advisor (ME & CE)

Year 3: 0.25 advisor (ME & CE)

Year 4: No additional staff

Hourly Support:

Hourly support provides graders and mentors within the department as well as supplying additional tutors to help for an increased load at the UW Tacoma Teaching & Learning Center (TLC). The fringe benefits rate for hourly staff is 20.9%. The salaries below do not include benefits.

Student support: \$20.60/hr

Number of additional hours requested each year:

Year 1: No student hourly

Year 2: No student hourly

Year 3: 1,200 hours of student support

Year 4: no additional hours added

Contract Services:

The charged-to-contract services include annual fixed costs for employees charged by the University. Such fees include the UW Technology Recharge Fee (\$666.12 per FTE) and Workday Cost Allocation (\$666.12 per FTE). As the programs become established a line for honoraria for an Industry Fellows Program (\$3,000 per year from FY22) is included.

Year 3: \$13k for ME

Year 4: \$13k for ME and \$13k for CE

Goods & Services:

Provides \$20,000/year per program for software licensing, \$35,000/year per program for library acquisitions/subscriptions; and fixed operations per diem for FTE employees (\$500 per FTE)

Year 3: \$63k for ME

Year 4: \$63k for ME and \$63k for CE

Travel:

Provides a fixed per diem per employee for travel: \$2000/FTE for tenure-track faculty, \$1,000/FTE for full-time lecturer, and \$250/FTE for staff.

Is the requested state funding needed on a permanent or temporary basis? *Temporary funding can only be requested for one year or two years. If a mix of permanent and temporary funds is needed, please note that there are very few examples of the legislature providing both permanent and temporary funding for a single item or initiative. If you believe that a mix is absolutely necessary, then please separate the permanent and temporary elements of the request in the table above and provide justification.*

The requested funding is permanent.

Justification and Impact Details

Please limit your responses to 200 words per question.

1. **What specific performance outcomes would be achieved?**

Describe and quantify the specific outcomes you expect as a result of this funding change (e.g. students served, courses offered, faculty or staff FTE hired, approximate economic impact, etc.)

As appropriate, answer:

- What outcomes and results will occur?
- What undesired results will be reduced or mitigated?
- Will your unit achieve new efficiencies? If so, how? Are cost savings generated?

Outcomes of the BSME and BSCE programs:

- Number of new students in ME is 90 and in CE is 90 (juniors and seniors only).
- Number of new courses in ME is about 32 and in CE is about 32.

Economic Impact:

- Support manufacturing sector expansion in South Sound.
- Attract more jobs in ME and CE and related disciplines to South Sound area (4.3 other jobs are created for every job created in these sectors³).

Mitigations:

- Proposed programs will enable place-bound students to study engineering close to home, [their preference](#). If these degrees are not available, students will study other majors, or leave the region or state.

Efficiencies:

- Courses/facilities shared between ME and CE: sophomore courses and labs in materials, hydraulics
- Courses shared between ME and electrical engineering: circuits
- Courses shared between ME/CE and computer science & systems: programming
- Interdisciplinary research enabled in robotics, energy, material science
- Cost per student kept down by maximizing use of resources (faculty, staff, space, labs)
- Interdisciplinary collaboration with business students to design products that support new businesses.

2. **How does this proposal support the UW's goals and/or values?**

Please refer to this [strategic planning document](#), which was based on the UW's Sustainable Academic Business Plan and was part of the UW's 2017-19 state budget submission. Identify which UW goals and/or values your request supports and how.

- Value-Diversity: More than half of potential program students in local community colleges and high schools are first-generation, come from low-income families, or are non-white. UW Tacoma has a proven track record supporting, retaining and graduating these students.
- Values-Collaboration/Innovation: Increased collaboration among units at UW Tacoma, creating educational/research opportunities in crosscutting areas such as robotics, energy, sustainable living, material science, and product design; curricula will offer educational opportunities infused with innovation and entrepreneurship.
- Goal-Transform: These programs embrace technology and interdisciplinary collaboration to meet needs of a diverse student body, and they add fuel to UW Tacoma's transformative impact on the South Sound region, particularly in manufacturing and small business sectors.

³ "Technology Works: High-Tech Employment and Wages in the United States, Bay Area Council Economic Institute, Dec. 2012, retrieved from <http://www.bayareaeconomy.org/files/pdf/TechReport.pdf> on April 11, 2018

- Goal-Preserve Access: The diverse body of place-bound students in the South Sound will have access to engineering majors while helping expand the number of Washington residents prepared to take advantage of the tech economy.
- Goal-Invest in Infrastructure: Thoughtful, sequenced launching of engineering majors at UW Tacoma leverages efficiencies through intentional sharing of courses, labs, space, and other facilities.
- Goal-Invest in People: These programs promote the success of students from diverse backgrounds. Outreach programs to regional school districts will encourage students to set goals to pursue STEM education at a young age.
- Goal-Increase Revenue: These programs will lead to new external funding for research, new philanthropic gifts, and balanced revenue streams.

3. How does this proposal support the Governor’s Results Washington goals?

In your response, please cite one or two specific goals that this proposal is responsive to. For example: “Our proposal supports Results Washington goal 1.3 as the funds would be used to expand enrollment in the following areas...” To review the Results Washington goals, visit the website linked above and click on the five icons.

Results WA goal 1.3 (World Class Education): Increase engineering degrees by 90 graduates per year in Pierce County. Note that Pierce County has a lower number of STEM majors compared to other counties in the Puget Sound (Washington Pathways Project). The South Sound region is a highly dense population center with poor access to engineering degrees, whereas the Washington Pathways Project indicates students largely stay in the region for baccalaureate education.

Results WA goal 2.2 (Prosperous Economy-Thriving Washingtonians): The BSME and BSCE majors are pathways to high-paying jobs, thereby increasing the average earnings of citizens of the South Sound and preparing them for jobs currently being filled by people from out-of-state.

4. What funding alternatives has your unit explored for this proposal, and why was this path chosen?

Discuss the pros and cons of the alternatives, why they were not selected, and why the recommended funding path was chosen. Why is state funding the most appropriate mechanism to fund this proposal?

Alternative sources of funding considered were UW and philanthropic gifts. Both these sources were not enough for faculty and staff needed for the BSME and BSCE programs. Funds from UW and gifts are more appropriate to increase the quality of the program.

State funding is appropriate because of the high level of funding needed (for new faculty and staff). This investment is appropriate for the state because of the number of people affected (students and their families in the South Sound), the number of South Sound industries affected, and the cumulative effect of increasing STEM educational attainment statewide.

5. What are the consequences of not funding this proposal?

Describe the consequences to desired outcomes and stakeholders if your request is not funded by the state.

- Educational opportunities in engineering would not be available to South Sound residents. A significant percentage of South Sound residents interested in BSME and BSCE majors would be forced to study other majors or leave the region or the state.
- Efficiencies realized by adding ME and CE majors to existing majors in computer science, electrical engineering, and computer engineering would not be realized.
- New research opportunities created by ME and CE majors would not be realized.
- The manufacturing industry, including Boeing, Globe Manufacturing, Jesse Engineering, etc., is very interested in this program’s potential to support their workforce and expand manufacturing in the region. We would lose an opportunity to deliver on the hopes and desires of industry.

- The region would not gain a significant driver for innovation, transformation and economic development in the South Sound region, which would add to the UW's overall impact in the state and particularly our ability to serve traditionally underserved populations with STEM education.

6. How has or can your unit address this issue within its current budget? How might your unit provide stable funding for this work if state support is inconsistent or insufficient?

Explain how/whether your unit would support this work without any support from the state (if the request is not submitted, or if it were submitted but not funded), or if the state provided temporary or partial funding for the request. If you are unable to identify an alternative funding strategy, please make that clear and provide an explanation.

The current unit budget cannot support these two new degree programs in mechanical engineering and civil engineering because of the significant start-up costs of the programs. There is not a sustainable alternative funding strategy for lab equipment, faculty and staff.

7. If funded, would this proposal require new space, alterations to existing space, or increased maintenance?

Describe any new space, alterations to existing space, or increased maintenance that may be needed. If so, please keep in mind that any needs of this type will require coordination with Capital Planning & Development.

New space with labs and classrooms is required for the two new proposed majors. \$500,000 for the predesign of a new Academic Building for high-demand programs was approved in the current biennial capital budget. UW Tacoma has a strong track record for securing construction funding from the legislature once predesign funding has been provided. The BSME and BSCE programs will start before the construction of the new building is complete. These programs will be housed in temporary leased space with lease expenses covered by UW Tacoma.

8. Should any other information be considered when reviewing your proposal?

If additional information would provide important context for your request, please include it here. For example:

- *Would the requested state funding be leveraged to secure other funds (e.g. federal, philanthropic) or vice versa?*
- *Is this proposal scalable? (E.g. if provided with half of the requested funding, could you adjust your activities accordingly?)*
- *Do any stakeholders (e.g. students, community members, etc.) have concerns about this proposal? If so, why?*
- *Do any stakeholders strongly support this proposal? If so, why?*

Leveraging State Funding: Philanthropic gifts would be used to improve the quality of the program via faculty endowments, student success programs, and student scholarships. In addition, these state operating funds would allow us to leverage significant philanthropic support for construction of the Academic Building.

Scalability of State Funding: The funding is not scalable because the proposal is carefully calibrated and balanced to be the most efficient way of launching these new programs while maximizing the student outcomes, leveraging faculty and staff hires and new academic space that is in the pipeline via an upcoming state Capital Budget request.

Support from Stakeholders: The BSME and BSCE programs have very strong support from the Naval Undersea Warfare Center, Tacoma Public Utilities, Peninsula Light, Pierce County, the Economic Development Board of Tacoma-Pierce County, the City of Tacoma, and many South Sound companies, including aerospace manufacturing suppliers, producers of industrial equipment and engineering firms, among others.

Some regional employers of BSME and BSCE graduates would be AHBL, Allegis Group Company, Amazon, Boeing, Blue Origin, City of Tacoma, Composite Solutions Corp., DEA (David Evans & Associates), GeoEngineers, Globe Machine Manufacturing, Hamilton Construction Company, Hummingbird Scientific, Hydro Systems, Jesse Engineering, Joint Base Lewis-McChord, KPFF Consulting Engineers, Milgard Manufacturing, NUWC (Naval Undersea

Warfare Center), PACCAR, Parametrix, Pacific Gas & Electric, Peninsula Light, Port of Tacoma, RH2 Engineering, Tacoma Public Utilities, Toray Composites, and Tres West Engineers.