

UNIVERSITY of WASHINGTON
FY2021 Annual Review Narrative Survey

Unit Name: College of Engineering

Programmatic & Academic Vitality Narratives

- 1)** Have you made any changes to your unit's annual budget development process from the response provided last year? If yes, please briefly describe the changes you've made to your unit's annual internal budget development process. If no, please answer with a simple, "no changes." *Word Limit: 500*

The annual budget process in the College of Engineering (COE) has not undergone any significant changes during this past year. COE is a departmentalized college with ten academic units, including nine departments and one school. COE has a longstanding allocation model grounded on an incremental budgeting process. Over the past three and a half biennia, allocations of new permanent tuition or supplement funds have been deployed to offset increases in permanent costs, which are generally associated with merit, faculty promotion, and retention. Any residual funds have been used either to build reserves for faculty startup or for strategic investments such as facilities improvements.

Each year, as a part of preparation for the budgeting cycle and fiscal vitality submission, quantitative and qualitative data from the local units is collected and incorporated into the College submission. Each spring, the dean meets with chairs/directors and administrators to assess each unit's overall vitality and plans, including key initiatives, faculty hiring, research, annual key performance indicators, and infrastructure needs.

Annual review materials, including the financial report and forecast, are presented and reviewed by the elected Engineering Faculty Council, College of Engineering Student Advisory Council (COESAC), and the Executive Committee.

- 2)** Have you made any changes to your unit's strategic plan in the past year? If yes, what are 3-5 key elements of your unit's new/revised strategic plan? If no, please comment on the progress you've made in 3-5 key areas of your strategic plan. *Word Limit: 500*

Under Dean Michael Bragg, the College established a five-year strategic plan in 2014 that was focused on excellence and access. The 2014-19 plan outlined a vision in which the College sought to be a world leader in engineering education, discovery, and innovation that benefits the region, nation, and the world. Below is a brief summary of the accomplishments from the prior five-year strategic plan:

- *Introduced Direct-to-College admissions process to improve the student experience*
- *Developed a four-year curriculum and student support programs as a result of DTC; expanded partnerships with UW Housing & Food Services to offer engineering living-learning community and makerspaces in residence halls*
- *Secured state support to grow enrollment, expand facilities and to permanently fund the STARS academic redshirt program to increase access and diversity for undergraduates*
- *Hired 80 new faculty members to join the UW community*
- *Opened the Career Center @ Engineering (in conjunction with the UW Career Center) to support and connect engineering students and industry partners*
- *Established the Institute for Nano-engineered Systems and the Quantum Initiative*

Under Dean Nancy Allbritton, COE is excited to begin a new strategic planning process in 2020, in concert with the College's vision and mission and in sync with the University's values and key initiatives. We will undertake a collaborative process that includes input from faculty, department chairs, graduate and undergraduate students, staff, postdoctoral employees, prospective donors, donors, and campus and industry partners. We anticipate

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leveraging existing University efforts around planning and data collection, including the Simpson Scarborough Research Project. We intend to explore a number of opportunities and issues, including:

- *Building UW Engineering affinity that crosses all disciplines*
- *Evaluating capacity constraints and expansion efforts*
- *Working with industry partners to better address their needs and demands, serve students, and support faculty research*
- *Developing initiatives to bolster the College's national reputation across all audiences, including peers, industry partners, donor communities, and prospective students*
- *Building a strong COE eco-system that emphasizes cohesiveness and interdisciplinary work*
- *Planning education and research direction and fundraising initiatives*
- *Continuing focus on diversity, equity, inclusion and access*

Plan completion is slated for December 2020.

- 3) What major obstacles or institutional barriers currently do, or will, hinder execution of your strategic plan? What are you doing to address these challenges? If no changes from your response to either component of this question from last year, please answer "no changes": *Word Limit: 250*

Many of the challenges presented in prior year reports continue to persist this year. Specifically:

- *Continuing Challenge 1: Lack of quality space to meet student, industry, and research demands*

Table 1: Projected Space Need for 2026, per 2016 COE Space Assessment & Academic Facilities Plan

College of Engineering Identified Gross Square Footage	
<i>1,673,500 GSF</i>	2026 COE Space Need (per 2016 Space Assessment & Facility Plan)
<i>1,324,500 GSF</i>	Current COE Space Assignment
<i>349,000 GSF</i>	Additional Space Needs

- *Continuing Challenge 2: Unit-Funded Merit, Promotion, Unit Adjustment and Retention*
 - *COE has self-funded all or a significant portion of merit, promotion, unit adjustment and retention costs over the past few biennia, approximately \$1.8M in GOF/DOF in FY19.*
- *Continuing Challenge 3: Recruitment, hiring, and retention of outstanding faculty*
 - *Maintaining a competitive salary structure remains a challenge. Unit adjustments continue to be a useful tool in this regard.*
 - *COE continues to explore how to best identify the appropriate mix of junior and senior faculty. We currently follow the "80/20" junior/senior mix, but believe changing the mix would benefit COE and the University:*
 - *Increasing the proportion of senior hires may be cheaper and reduce risk. A recent review of 122 COE faculty that started their UW positions in fiscal years 2010-19 suggests recruitment at the associate rank is less expensive and yields a greater ROI when compared to recruitment at the assistant rank (see Table 2).*
 - *Emerging disciplines require senior leadership.*

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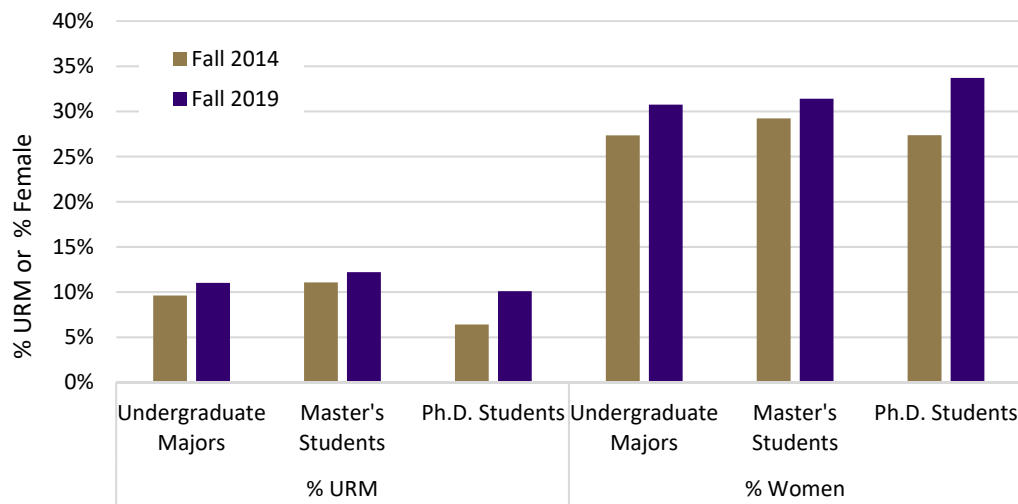
Table 2: Return on Investment, Assistant versus Associate Faculty (2010-19)

Rank at Start of UW Appointment	Assistant	Associate
Number of Faculty	89	33
Total Startup	\$ 52,026,200	\$ 16,465,800
Total Sponsored Project Research Awards	\$ 142,860,000	\$ 80,330,000
Average Startup per faculty	\$ 584,600	\$ 499,000
Average Sponsored Project Research Awards	\$ 1,605,000	\$ 2,434,000
ROI (Sponsored Project Award per Startup Invested)	2.75	4.88

- *Continuing Challenge 4: Recruitment and retention of diverse faculty, students, and staff*

As shown in Figures 1 and 2, the College has been successful increasing diversity, but we seek to continue this progress.

Figure 1 – Changes in the Demographic Composition of College of Engineering Students

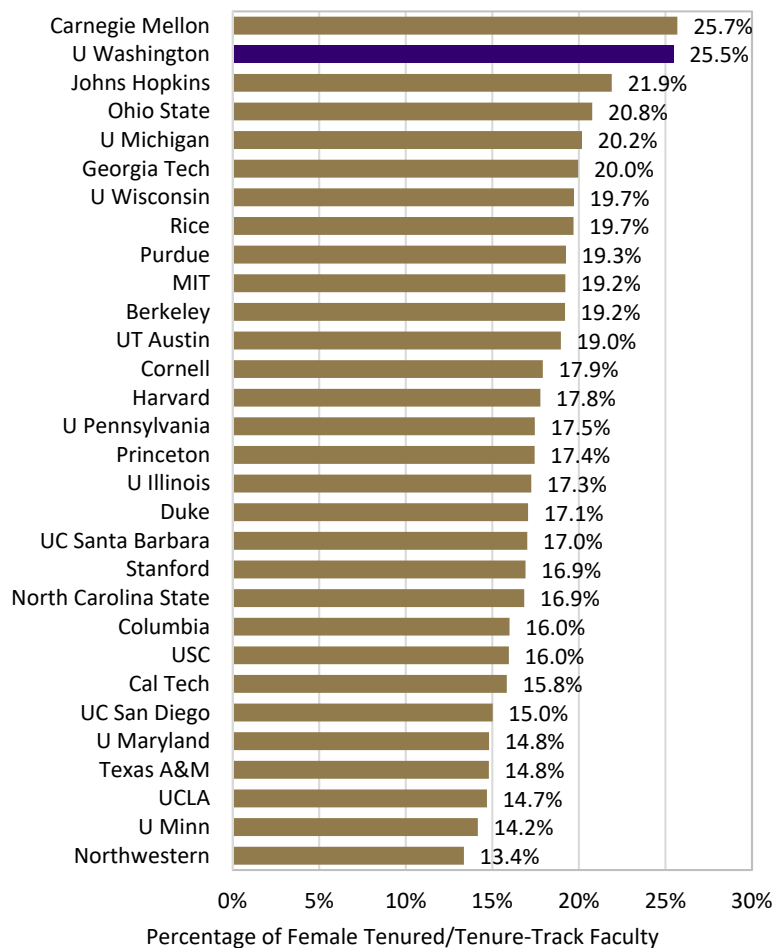


- *New Challenge 5: Expand support and programming for Graduate Students and Postdoctoral Scholars*
- *New Challenge 6: Recognition of differential costs to educating and producing Engineering degrees*
- *New Challenge 7: Build a College culture and framework to increase collaboration and cohesiveness*

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Figure 2 - Percentage of Fall 2018 Female Tenure-Track Engineering Faculty, US News Top 25 Engineering Programs



- 4) Over the next year, could any of your planned strategic activities result in material changes to revenues or expenditures, faculty or staff workload, or the student experience within your unit/campus and/or another unit/campus? *Word Limit: 500*

A number of the College's planned strategic activities may result in material changes to revenues or expenditures, faculty or staff workload, or the student experience over the next year.

- As appropriated in HB 2158: \$2,000,000 for fiscal year 2020 and \$4,000,000 for fiscal year 2021 to increase degree production in the College of Engineering at the Seattle campus. Our planning and expectations are that this appropriation will be ongoing. We plan to hire approximately 26 new faculty members in order to meet the increased degree production required by the legislature (approximately 133 additional degrees by 2024-25). We project **additional startup costs of \$18M** for these hires. We will work closely with departments, industry partners, and potential donors in order to support these additional investments in teaching and our students.*
- For Biennium 21-23, the College of Engineering is requesting **\$45M from the State Legislature** to begin construction of a new interdisciplinary teaching and research facility. The College is devoting significant resources toward Advancement efforts and donor cultivation with the goal of raising gifts to support construction.*

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- *As a part of our plan to increase collaboration and cohesiveness across the College, we will leverage a portion of proviso funds to hire faculty in a “cluster.” **Cluster hiring** is a common practice in higher education and can be defined as hiring multiple faculty into one or more departments based on shared, interdisciplinary interests. Cluster hiring will help meet instructional gaps, improve our effectiveness in hiring high-quality faculty members, and enhance our research competitiveness for new awards and grants. Cluster hiring will require significant planning, resource management, and partnerships across both Engineering units and departments outside of COE.*
- *As Finance Transformation shifts from the foundational phase to implementation, the College continues to devote time and effort towards this critical University program. The College has already implemented a “**shared service**” model that addresses staffing turnover and potential gaps in specific financial services. In addition, over the past two years, the College has **standardized internal financial information** and assumptions with a common multi-biennia template.*
- *One consequence of **Direct-to-College** admission has been the shift from a two- to a four-year experience for students in the College of Engineering. In order to better address the needs of students, the College has prioritized adding positions and programs that most impacts the student experience, including increasing the number of advisors.*
- *Additional planned strategic priorities that may result in material changes to revenue and expenditures include efforts to improve the **graduate student experience**, along with additional support and programming for **postdoctoral scholars**.*

5) What is your unit doing to effectively use or redeploy resources in a way that benefits your unit/campus and/or other units/campuses? *Word Limit: 500*

- *The College of Engineering currently deploys an interdisciplinary shared services unit (Collaboration Core) that includes the Institute for Nano-Engineered Systems, Molecular Engineering & Sciences Institute, and the Clean Energy Institute. The Collaboration Core provides a range of administrative support service including grant and financial support, events coordination, and marketing & communications. The College is currently exploring ways to expand its shared services. Any potential changes would be made in conjunction with anticipated changes in Finance Transformation.*
- *The College has also made significant headway in the area of **Computing Technology** management. Specifically, a number of services that were previously run at the local level, i.e. servers supporting email, domain name systems, and dynamic host configuration protocol, are now managed at the Dean’s Office.*
- *Earlier this year, the College worked with UW Facilities and the School of Medicine to find a temporary solution to a **University facility issue**. The College and the Institute for Nano-Engineered Systems entered into a two-year agreement (which expires July 31, 2021), to house the Institute for Protein Design (IPD). Approximately 7,811 square feet have been assigned to IPD to help support their growing needs while the University seeks a more permanent solution. The College expects that as Engineering faculty hiring continues to ramp up, Engineering will recapture the space temporarily assigned to IPD and SoM at the end of the two-year period.*

6) For UW student facing units, what are you doing to improve the experience and outcomes of students on your campus or in your unit? What could the University do to support your efforts? *Word Limit: 500, Leave blank if N/A*

In Fall 2018, COE implemented the Direct to College (DTC) admission policy in response to concerns from

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students and faculty about the undergraduate student experience. Incoming freshmen admitted to the College now engage in an immersive engineering experience from their first day. As the College shifts from a two-year model to a more inclusive four-year program, we are dedicated to maintaining college-wide and unit-specific cultures that embrace and celebrate diversity, equity, inclusion, and access for students as they explore the multiplicity of engineering disciplines and pathways to their desired career goals.

A sample of programs aimed at supporting a positive, diverse and inclusive student experience:

- *Washington State Academic RedShirt (STARS) program – supports students from low-income, first generation, and underserved backgrounds*
- *The Women in Science and Engineering (WiSE) program*
- *Minority Scholars Engineering Program (MSEP)*
- *Career Center @ Engineering – a partnership between COE and the UW Career and Internship Center*
- *E-FIG program – includes training of Engineering Peer Educators (EPEs) to host Engineering-specific First-Year Interest Groups (FIGs) for the Engineering Undeclared (ENGRUD) students in their first quarter at UW*
- *Engineering Exploration Night – connects engineering alumni with students to talk about their career paths*
- *Engineering lab tours – 130+ tours to familiarize students with labs and potential research opportunities*
- *Launching Your Engineering Career – brings together a wide array of holistic campus resources and students to help prepare DTC students for the rest of their first-year experience*
- *Women in Engineering Community Dinner – connects female faculty in COE with female ENGRUD students to build mentorship, community, and a sense of belonging*
- *Planning a Meaningful Summer – helps students reflect on their first-year experience and plan ways to maximize their summer (COE advising team in partnership with OMA&D and the Career Center at Engineering)*

Since the implementation of DTC, the undergraduate experience has changed dramatically. Evaluations from the past two autumn quarters indicate students are having an overwhelmingly positive experience with an unprecedented 94% retention in the College from the first to second year.

An additional College priority is providing students the financial support that they need in order to thrive. There are two major sources of support available to graduate students:

- *Salary associated with assistantships and stipends associated with fellowships, and*
- *Waivers of tuition (often a result of a research grant paying tuition on behalf of the student).*

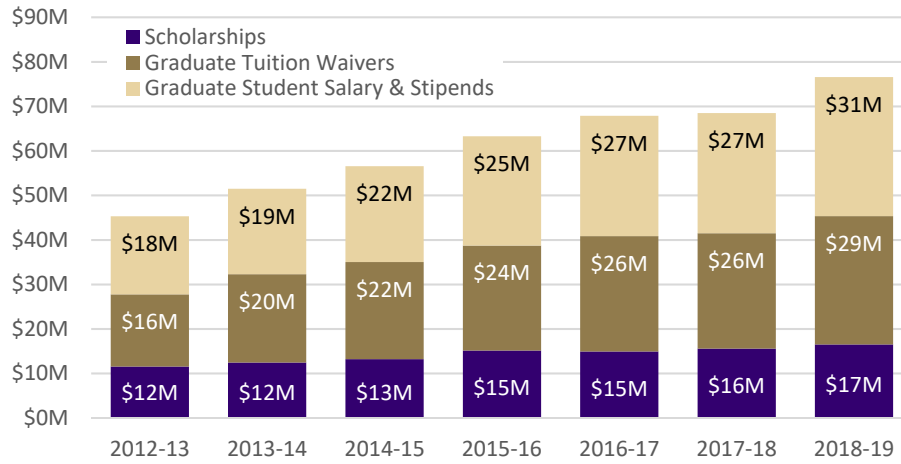
In addition, scholarships are available to undergraduates and graduate students. The trends for these three types of support are shown in Figure 3.

This past year, the COE received \$573,980 from the Provost Office for graduate fellowships. These funds were extremely impactful and supported fellowship awards to nine incoming graduate students. Six students in six departments (A&A, CEE, CSE, ECE, MSE, ME) received one-year fellowships, and three students were selected to receive top-off awards of \$10,000 per year for four years to supplement departmental funding offers.

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Figure 3 – Financial Support for Students



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Tuition Based Program Rate Recommendations - Narrative Section

Responses to the questions below are required for each tuition category that your unit/campus recommends adjusting. If you are recommending changes for multiple tuition categories, please differentiate your responses within each question.

- 1) Please explain why each proposed change is needed and how your unit/campus will use new incremental tuition revenue increases or absorb incremental tuition revenue losses.

The recommended increases in tuition rates are needed to cover increased costs, particularly for faculty, staff and TA salaries and benefits. Each program has also specified other increasing costs unique to the program, such as the need to improve lab equipment or the costs for prototyping materials

- 2) Explain whether and how each proposed change will affect peer comparisons and/or whether a market analysis was conducted.

Both resident and nonresident Graduate Tier III tuition rates are comparable to rates for non-professional graduate programs at peer institutions. Peers have been identified for each of the professional master's programs with a unique tuition category (Applied Bioengineering, Chemical Engineering, Industrial & Systems Engineering, and Materials Science & Engineering), and each program has tuition comparable or slightly below that for peer programs at public institutions and substantially below that for peer programs at private institutions. The recommended increases are not expected to affect relative market position.

- 3) Discuss the impact of each proposed change on student debt load.

The four programs with specific tuition categories are each intended to be one-year programs. As a result, tuition increases only affect costs for one year rather than being compounded over many years, creating less of an overall effect on student debt relative to increases in tuition for programs with longer duration.

The effect of an increase will be somewhat different for the four programs:

- *A fairly low percentage of students in two of the four programs - Chemical Engineering and Industrial & Systems Engineering - take loans (fewer than 5% of these students take federal, Grad PLUS, or institutional loans). As a result, the effect of a tuition increase on student debt will involve fewer students for these two programs.*
- *A somewhat higher percentage of Applied Bioengineering and Materials Science & Engineering students take federal, Grad PLUS, or institutional loans, but fewer than 25% of students do so.*
- *Given that these are one-year programs and given the subset of students who take loans, the average effect on loan debt is expected to be an increase in total loan debt of about \$800 per student.*

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- 4) Describe whether you expect the proposed tuition rate(s) to result in any substantial changes to enrollment (including a change in the resident/nonresident composition) or to the volume of waivers awarded.

Each of these tuition rates is in the expected range for similar programs at public institutions and well below rates at private institutions. Given that the proposed changes will not change the relative price of the programs, we project no change in enrollment.

The bulk of waivers awards to students in the Tier III tuition category are generally a function of student appointments, and the rate change is small enough that it is not expected to lead to a change in the number of appointments funded by grants. The students in the non-Tier III tuition categories do not typically receive waivers. Thus, no change in the volume of waivers awarded is expected.

- 5) For each proposed change, please explain what would happen if the change were not implemented (e.g. deficit, loss of staff positions, etc.). If a proposed change is part of a plan to eliminate a current deficit, please indicate that.

The tuition increases requested are set to match increases in costs. If tuition rates are not allowed to keep pace with costs, the programs will need to reduce expenditures, including those for instructional staffing. Such reductions will lead to a reduction in program quality.

- 6) For each tuition category that you have proposed changing, please discuss your unit/campus's overall tuition rate strategy for the next 3-5 years. In your response, please explain whether and how your long-term strategy connects to "market" rates (e.g. where do you want to be, rate wise, compared to peers?)

Each program has two goals that guide tuition-setting strategy:

- *Remaining competitive to peers in cost and duration of programs, and*
- *Ensuring sufficient support to maintain the quality and desirability of the program.*

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Communication with Faculty & Student Stakeholders

Communication of your unit's annual review materials, including fiscal vitality data, narrative responses and tuition rate recommendations is an important and necessary component of the University of Washington's Annual Review process. Your responses to the questions below will be documented and included as part of the annual review materials provided to Executive Leadership of the UW.

If the meeting schedules of faculty and student leadership groups present a challenge, please make accommodations to get approval within the necessary time frame. If necessary, you may submit an update to OPB at a later date, after faculty and students have had an opportunity to review.

- 1) Please select the date that FACULTY leadership within your unit/campus was consulted and provided the opportunity to provide input as part of this budget planning exercise. If, due to scheduling difficulty, you are unable to consult with faculty leadership before the February 3, 2020 submission deadline, please select the date you are scheduled to consult with FACULTY leadership and, immediately after that date, please provide an update to Jed Bradley

The College of Engineering Elected Faculty Council (EFC) was consulted:

Tuesday, January 21, 2020

- 2) Please list a point of contact for your FACULTY leadership (name and UW email address)

Professor Sumit Roy, Electrical & Computer Engineering, sroy@uw.edu

- 3) Please select the date that STUDENT leadership within your unit/campus was consulted and provided the opportunity to provide input as part of this budget planning exercise. If, due to scheduling difficulty, you are unable to consult with student leadership before the February 3, 2020 submission deadline, please select the date you are scheduled to consult with STUDENT leadership and, immediately after that date, please provide an update to Jed Bradley

We consulted with the College of Engineering Student Advisory Council (COESAC):

Friday, January 24, 2020

- 4) Please list a point of contact for your STUDENT leadership (name and UW email address)

Takunda Masike, 2019-20 COESAC Chair, ttmasike@uw.edu

- 5) Enrolled students affected by tuition rate increases should be consulted on proposed increases before proposals are finalized. Please describe when and how students were consulted and summarize the feedback they provided regarding EACH of your tuition recommendations.

The COE Student Advisory Council (COESAC) was consulted on January 24, 2020. Students asked how the COE intends to cover ongoing costs increases to fund existing and new initiatives. After a brief explanation, as well as a conversation about peer rates and the estimated effect on debt load, student council members did not indicate concerns to the proposed increase.



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Each of the four programs with a specific tuition category is one-year in duration; as such, currently enrolled students are not affected by the proposed changes. Nevertheless, the four units either held small group discussions with existing students or informed and consulted students via e-mail.