

# Baskin School of Engineering Regularization: A Proposal to Complete the Establishment of a Professional School of Engineering at UC Santa Cruz

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## Overview

In 2022, the Baskin School of Engineering will reach its 25th anniversary. Opening in 1997 with just two academic departments – Computer Science and Computer Engineering – it now consists of six academic departments and is home to a third of the graduate students at UC Santa Cruz and a quarter of the undergraduate majors. As part of the university’s celebration of its engineering school, we seek to complete the project that was envisioned at the founding of our campus: the formation of a fully functioning professional school of engineering on the UC Santa Cruz campus.

The original plans for UC Santa Cruz included the formation of a school of engineering and, in September 1966, [UC Regents Standing Order 110.1](#) was amended to establish “a [Professional] School of Engineering, at UC Santa Cruz, with curricula leading to the degrees of Master of Engineering and Doctor of Engineering.” This formal regential action enabled the campus to open the school, which it eventually did thirty-one years later in 1997. In the years since, M.Eng. and D.Eng. degrees have never been formally offered and conferred at UC Santa Cruz, likely because these are not attractive degrees in the context of a research university. Instead, as is true of the three other Regents-designated professional schools of engineering within the UC system—UCI, UCLA, and UCSD—as well as all other R1 universities with professional engineering schools in the US, the engineering faculty at UC Santa Cruz are responsible for mounting BA, BS, MS, and PhD curricula.

In the years since 1997, the resources and policies allowing Baskin Engineering to exercise the full extent of common professional school rights were not in place and the climate of the campus was yet not “ready.” More recently, however, with student demand for STEM education having grown steadily in response to the growth of the tech industry and our technology-driven society, professional engineering degree programs have become an essential element of the university.

Baskin Engineering has nevertheless stepped up to meet this challenge on behalf of UC Santa Cruz, albeit without operating as a true professional engineering school, which includes in particular *direct admission* to the school and the right to recommend the *conferral of its degrees*. This has negatively impacted various important aspects of the school, including its visibility, standing, and student demographics.

Consultation with campus administrative leadership, Senate leadership, Senate committee chairs, the vice provosts, the dean of the graduate division, the chair of the council of college provosts, and key senior staff in the Admissions and Registrar's offices, has helped shape this proposal, and we are grateful to these campus colleagues for their time, insights, and expertise.

## Direct admissions

In consultation with CEP, the Baskin School of Engineering established in 2018 an enrollment management process for entering frosh students who intend to major in the Computer Science BS and BA degree programs. Baskin Engineering currently makes admissions recommendations for all graduate program applicants and for transfer applicants to its undergraduate programs. **We propose to establish holistic, direct admissions for all frosh applicants to undergraduate BS and BA engineering programs** (see Appendix I for a list).

It is important to state that we are not proposing to “perform our own admissions.” Rather, we are simply proposing that the Office of Admissions, home to expert staff in university admissions, apply school-wide and program-specific admissions criteria to those applicants who have indicated a desire for an engineering degree, as they do now for the Computer Science BS and BA programs. This is standard practice for university admissions to professional schools across the country.

### *Why?*

Students are attracted to professional degree programs that they perceive to be competitive. Establishing direct admissions across the board will signal to prospective students that admissions to engineering at UC Santa Cruz is competitive, that they will be studying with student colleagues who themselves are highly qualified and highly motivated, and that a Baskin Engineering degree will prepare them well and give them an edge when they graduate. Being able to advertise direct and competitive admission would help give identity to the school and align it positively with aspirational peer institutions in the AAU.

The current arrangement, in which two large and popular degree programs are stigmatized as “impacted” signals that the programs are over-subscribed, and hence less desirable than those programs might be at other engineering schools. Moreover, it could signal to some potential applicants that the other degree programs in the school are non-competitive and of lower quality, which of course is not the case. By contrast, if all engineering programs require direct admission, even keeping for them the admissions criteria as they are today, we signal that the school as a whole is competitive, not that only particular programs are competitive or, perhaps worse, merely exceptionally crowded, where “competitive” translates to long course wait lists.

UC Santa Cruz overall has a relatively diverse student body. This is not the case for Baskin Engineering, which mirrors engineering programs across the country in terms of the percentage of women enrolled, has slightly larger LatinX enrollments, and lags significantly behind in terms of the

number of Black and Native American students. Clearly, the approach taken for broad admission to UC Santa Cruz has not worked well for engineering. In partnership with CAFA and the Office of Admissions, strategic, engineering-specific measures can be established to cultivate more diverse engineering cohorts. Baskin Engineering is currently involved in a working group to address ways of increasing the number of students from historically excluded groups among our transfer cohorts, as well as ways to support their success and attainment. The results of this important work will help inform our future efforts at recruiting more diverse frosh cohorts in engineering. And organizations that we are involved with such as ASEE, NCWIT, ACM and others focus on engineering-specific strategies to increase diversity in recruitment and admissions. Their resources will also be able to further inform our campus strategy. Finally, given the number of students majoring in engineering, further diversifying the Baskin Engineering student population would have an outsized positive impact on the diversity of the university as a whole.

The transition to holistic direct admission will also present an important opportunity to create clear and well-reasoned paths for students wishing to move among engineering programs, a process that is today challenging at best, and in some cases precluded entirely. Similarly, students wishing to switch from a non-engineering program into engineering currently face a number of barriers, and the majority of students who leave an engineering program leave UC Santa Cruz altogether, a pattern that we clearly need to correct. We intend to use this opportunity to create greater flexibility as it relates to changing programs, and the mechanisms for doing so will be equitable, clearly presented, and focused on student success.

### *How?*

#### Admissions criteria

Convened by the Associate Dean for Undergraduate Affairs, the undergraduate directors of our six departments will meet and propose admissions criteria to be applied to all Baskin Engineering applicants. Those criteria will be brought to the department faculties for review and approval. Subsequently, department faculties will consider whether program-specific admissions criteria should also be set. Once all criteria are approved by the respective department faculties, we will consult with CAFA and the Office of Admissions before jointly finalizing the criteria.

#### Admissions process

Baskin Engineering will work with COC to seat a faculty member on CAFA, and will work with CAFA to ensure that this representative member is also on CAFA's Data Subcommittee, which works with Admissions to shape the incoming frosh cohort each year. The Chair of CAFA has advised that a term of three years would be most efficacious for a Baskin Engineering CAFA/Data Subcommittee representative.<sup>1</sup> We will propose a modification of the CAFA charge (Senate bylaw 13.11) to ensure that this arrangement is maintained in perpetuity. In recognition of the fact that UC

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<sup>1</sup> The groundwork for this has already been laid: In AY 2021-22, Prof. Marcella Gomez of Applied Mathematics will join CAFA and its Data Subcommittee for a three-year term.

Santa Cruz may mount additional professional schools in the future, the proposed new language will not be engineering specific.

## Diplomas

Across the other UC campuses that house professional schools of engineering, engineering diplomas include the signature of the dean of the school. This practice goes beyond engineering and beyond UC for professional schools of business, law, fine arts, medicine, etc. At UC Santa Cruz, the practice is to include the signatures of only the UC president and chancellor, the college provost for baccalaureate degrees and the dean of the graduate division for MS and PhD degrees. **We propose to *expand* the list of signatories that appear on UC Santa Cruz engineering diplomas to include the signature of the dean of the school.**

### *Why?*

While largely ceremonial and symbolic, the practice of including an endorsement by the professional school at which a degree has been earned constitutes both an academic credential and recognition that the recipient is recognized as a member of that specific profession. Academic degrees differ in this way.

Moreover, given that Baskin Engineering staff must already certify a significant portion of a student's academic record before that student can be recommended for degree conferral, the school is central to the process of determining the eligibility of candidates for its degrees, both in setting the degree requirements and verifying that those requirements have been met by its students.

### *How?*

Baskin Engineering will work with the Registrar's Office to adjust the configuration of engineering diplomas to include the signature of the dean of the school, in addition to that of the graduate dean or the relevant provost.

Chapters 10.1 and 10.2 of the Senate bylaws identify the officers who are empowered to recommend the conferral of degrees. According to Senate Bylaw 10.1, the Faculties of the colleges have the authority to recommend to the Chancellor, for transmission to the UC President the award of the degrees of Bachelor of Arts and Bachelor of Science. Per Senate Bylaw 10.2, the Graduate Council, "in collaboration with the schools, academic divisions, and appropriate departments" has the authority to recommend to the Chancellor, for transmission to the UC President the award of higher degrees. Baskin Engineering hopes to work with the Academic Senate to propose a modification of these bylaws to grant this right to any professional school that exists now, or that will be mounted in the future.

Chapter 10.3 of the Senate bylaws require that “all agencies recommending the award of degrees report their action quarterly to the Secretary for the information of the Santa Cruz Division.” Assuming that doing so will not be redundant, Baskin Engineering will meet this reporting requirement. Should the Senate determine this action to be redundant, Baskin Engineering will work with Senate leadership to determine whether a change of bylaws should be proposed.

## Additional considerations

### Undergraduate programs

Baskin Engineering recognizes the importance of the college system to the UC Santa Cruz undergraduate experience. The colleges offer unique learning communities that expose students to important college-specific themes and values. They also provide an important source of support for students that Baskin Engineering lacks. Students of course also find community, academic opportunities, and support within Baskin Engineering. Our objective is to ensure that this duality is not disrupted and is, if anything, enhanced through the changes proposed here.

Once these changes have been approved and enacted, Baskin Engineering commits to continuous monitoring and reporting of their impact in a number of domains, including: (1) the diversity of students admitted to, enrolling in, and progressing through engineering programs; (2) the academic preparation of incoming cohorts; (3) the relative levels of achievement and early career success of student subpopulations;<sup>2</sup> (4) the inflows and outflows of students in engineering programs; and (5) as a measure of program balance, the student-to-faculty ratios in departments. Adjustments may need to be made in how degree progress is tracked, a responsibility currently shared between the colleges and the Baskin Engineering advising office, how academic petitions are reviewed and processed, and how to identify students who are struggling and determining the most effective interventions to get them back on track with the support they need.

### Graduate programs

While Baskin Engineering is not proposing any substantive changes to graduate recruitment and admissions, the administration of student funding, student support, or the degree check process, the school will continue to work in partnership with the Graduate Division to review these areas and discuss whether any changes should be considered.

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<sup>2</sup> We have partnered with the Division of Student Affairs and Success to hire a career services professional focused on engineering. This person is embedded within the Baskin Engineering office of Undergraduate Advising.

# Appendix I: Undergraduate Degree Programs at the Baskin School of Engineering

BS in Biomolecular Engineering and Bioinformatics

BA in Biotechnology

BS in Computer Engineering

BS in Computer Game Design

BA, BS in Computer Science

BS in Electrical Engineering

BA in Network and Digital Technology

BS in Robotics Engineering

BS in Technology and Information Management