

MATERIALS DEPARTMENT STRATEGIC ACTION PLAN FOR DEI [VERSION OF 19 OCTOBER 2021]

The Materials Department is deeply committed — with the rest of UC Santa Barbara and the University of California — to diversity, equity, and inclusion (DEI). The members of the Department fully endorse the College of Engineering statement that: *“diversity is indispensable in the College of Engineering, where richly varied perspectives and lived experiences enhance creativity and innovation”,* and that *“solutions that are more meaningful and have a greater positive impact, because they arise from a broader understanding of what constitutes the greater good and from an expanded awareness of who benefits from technological advances.”* We also adhere to the entirety of the UC Board of Regents Policy 440 [<https://regents.universityofcalifornia.edu/governance/policies/4400.html>] and call out one specific statement here that guides this document: *“Because the core mission of the University of California is to serve the interests of the State of California, it must seek to achieve diversity among its student bodies and among its employees.”*

UC Santa Barbara continues to strive to achieve an undergraduate enrollment that is better reflective of the demographics of the society we live in. At a fundamental level, we feel that it is important and equitable that demographics at the graduate student, postdoctoral researcher, and faculty levels, better reflect society at large. This goal requires that none of our selection practices at any of these levels of advancement are exclusionary and that the Department climate is respectful and inclusive toward all members of our community.

We have reflected on the state of efforts related to DEI in the Materials Department and have devised the following action plan, which also reflects our introspection. Retention is as important as selection, and we attempt to reflect and plan for this as well. The details of the areas and actions are as follows. An important consideration is that this is very much a living document; it is necessary and appropriate that this document evolve and improve constantly.

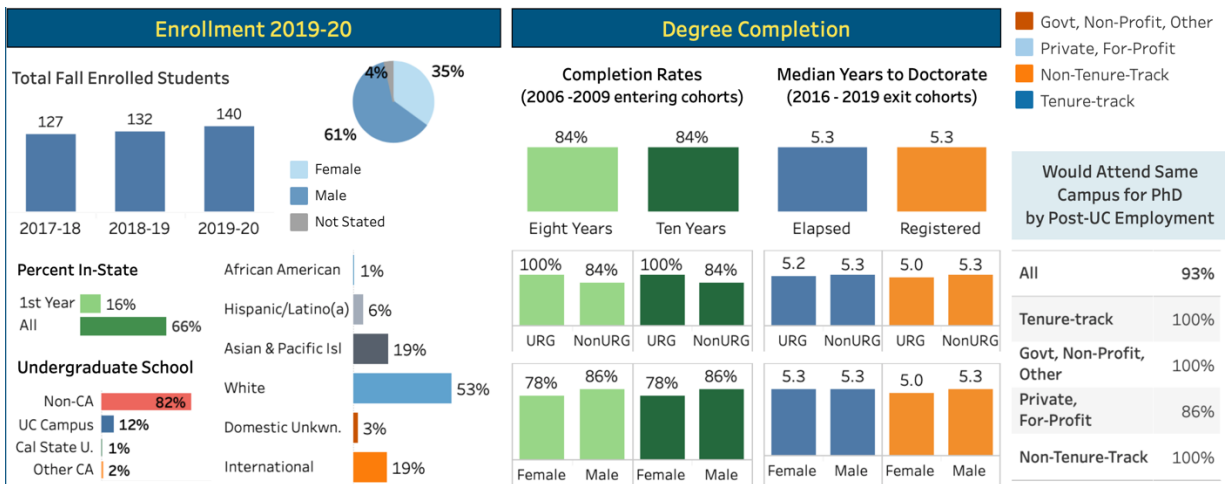
Relevant background on the Department

The only non-PhD students in the Department are those participating in the 5-year BS/MS program, where undergraduates majoring in Chemistry, Chemical Engineering, Electrical Engineering, or Mechanical Engineering can acquire an MS degree during the course of an added year after their senior year. Materials is otherwise primarily a graduate department whose student population comprises those carrying out research towards a doctoral degree. A large number of postdoctoral fellows are also trained by Departmental faculty. In addition to those directly hired through the Department, several postdoctoral fellows with Materials faculty mentors have administrative homes in centers such as CNSI and MRL. Undergraduate internship programs run out of the MRL and CNSI are also formally overseen by Materials faculty.

In this plan, we will start with a discussion of Graduate Admissions (including into the BS/MS program), and then discuss undergraduate internships, postdoctoral hiring and finally, faculty hiring.

Graduate admissions

It is relevant to consider that Materials is in many ways a somewhat atypical Department. It has a sizable graduate program, given the number of faculty, with the number of PhD students, as reflected in the accompanying figure, usually exceeding 125. A very large fraction of them are US citizens or permanent residents, which is unusual in the landscape of US engineering programs but implies that we are well positioned to significantly impact graduate diversity. In the absence of an undergraduate program and associated Teaching Assistantships, graduate students are supported by the Department for only one of their total (average 22) quarters at UC Santa Barbara, which means that every student is effectively supported either through a Fellowship or a GSR. One of the consequences is that the majority of students join with advisors of their choosing even before the Fall quarter of their first year. This funding model sets the targeted size of the incoming class each year and consequently the number of admitted students from the pool of applicants.



Data on Materials graduate students from the UC Doctoral Dashboard for Academic Year 2018–2020. [https://www.universityofcalifornia.edu/infocenter/doctoral-program]

Statistics from the Dashboard data presented above that are representative of a typical year, provide insights into several areas. The first is that while the Department is doing well on some metrics, notably, gender diversity, retention rate (particularly with underrepresented groups), time-to-graduation, and satisfaction with the program, all of which pointing to a relatively healthy graduate mentoring climate, there are clearly needs for improvement, particularly in regard to the number of under-represented minority (URM) students in the Department. Specifically, the more detailed data presented in the appendix clearly points to some important areas of improvement. These needs are indicated below in the form of observation and planned actions.

Note that our definition of URM follows that outlined by the National Science Foundation, where African Americans, Latinos/Hispanics, and Native Americans are considered under-represented in STEM. However, we acknowledge that this definition is limited and omits many other under-represented groups by consolidating all Asian ethnic groups into the broad category of AAPI (Asian Americans and Pacific Islanders), masking important differences in representation amongst these subgroups.

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(i) *The number of URM applicants to the Materials graduate program is small.*

- The Department needs to better engage in venues such as the conferences/conventions of organizations such as NSBE, NOBCCChE, SHPE, AISES, and SACNAS, and support attendance from all levels of Departmental members, and especially those faculty graduate recruitment committee. We will work closely with the Graduate Division to coordinate these efforts and to organize booths at these meetings. The first steps have been taken through the 2020 SACNAS Meeting.
- While the Department, though faculty leadership in programs such as NSF-PREM engages with some notable Minority Serving Institutions (UT El Paso and Jackson State University as examples) opportunities are being missed to better advertise the graduate program at many institutions, for example in other UCs, Cal States, and other HBCUs, AANAPISIs, and HSIs. In particular, the fact that the Department readily admits undergraduate students with backgrounds in the Sciences rather than simply in Engineering allows the recruitment pool to be significantly broadened. An immediate action item is to develop recruiting promotional materials.
- As a part of UC's systemwide effort to enhance faculty diversity, the Department is committed to pursuing funding opportunities to support the goal of increasing the pathways to graduate education. The faculty are having discussions with institutions that could lead to effective partnerships for UCOP programs for California Hispanic-Serving Institutions (HSIs) and Historically Black Colleges and Universities (HBCUs).
- We have edited our web page on admission to the graduate program to make portions more respect to financial support during the application process and after admissions. The FAQ section has been modified to include additional information to try to remove language that may incorrectly be perceived as a barrier for admission. We are developing promotional material for the Department targeted at to promote participation from all audiences for use at admissions events.
- A longer-range action item is to develop a funding stream so that the application fees could be waived for students from other UCs and the Cal States who request assistance.

(ii) *The number of African American students has consistently been small, which also means that to a prospective student, the Department may not appear to be welcoming.*

- The Department seeks to recruit a cohort of African American students, and to ensure that they visit together. Given the demographics in engineering, we recognize that bringing a large cohort may be challenging within any single department. We will therefore also try and work also with other COE Departments to better welcome and support URM graduate students during admissions time as a whole.

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(iii) Native American students make a very small fraction of the admit pool, and we have no specific outreach activities to attract more applicants.

- Los Angeles County is home to more Native Americans than any other county in the United States. A conscious effort needs to be made in this regard to spread the word about our graduate program to institutions where these students study. Numerous proximal R1 institutions including UCLA, USC, and UC Irvine have a diverse undergraduate pool, in addition to there being several Cal States of interest (CSU-LA, CSU-SB, etc.).

(iv) The yield of admitted URM students shows promise for improving the overall percentage of URM students; increasing the pool of applicants and attention to the balance of the diversity of the Department should lead to improved diversity.

- All US students visit the Department prior to deciding on whether they should select UC Santa Barbara and receive financial reimbursement for the visit. Our current graduate students are the most effective ambassadors to convince applicants to select UC Santa Barbara. We will work them to develop strategies to enhance the yield on URM admits. Our past efforts indicate that graduate student involvement has been crucial in enhancing the yield on female students

(v) The number of admitted students is limited by projections of funding and capacity in research groups.

- The Department has modified its request to Development for fundraising to include fellowships that concentrate on students who excel in science and contribute to efforts in diversity. Such Departmental fellowships would increase the number of admitted students.

(vi) AAPI concerns

- Hate crimes against the AAPI community rose by 1000% in the first year of the COVID-19 pandemic. However, the AAPI community has faced years of discriminatory policies and microaggressions. The “model minority myth” is a harmful stereotype that masks the diversity of the many ethnic subgroups within the AAPI community and the distinct underrepresentation of those identifying as southeast Asian in STEM and academia. To that end, the Department will focus on improving recruitment and admission outcomes of underrepresented AAPI groups.

Other relevant actions and changes associated with graduate admissions

Training of admissions committee members: For several years now, the faculty of the Materials Department, including those serving in the graduate admissions committee have annually taken the training offered by the Graduate Division, including attending Theatre Delta presentations, and listening to domain experts. Under the leadership of the VC for DEI, we eagerly look forward to these activities being refined and broadened. Additionally, we are confident that the campus-

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wide imprimatur that the VC brings to the table will focus attention on the importance of these efforts across the UC Santa Barbara community.

Graduate fellowships: Also clear is the need to best use Graduate Division and other Fellowships to attract URM students. The Fellowships at the present time provide the appearance of being separated into “excellence” and “diversity”. The Department is consciously ignoring this separation and using the personal statements of students as an important criterion for *all* fellowships.

GRE exam: The Department will not use GRE scores as a criterion for 2020–2021. The Department will re-assess usage after this admission cycle, but we note that in recent years, the GRE scores were not heavily weighted by the Admissions Committee and certainly not used to exclude students with promising trajectories. The Department has now implemented a rubric-based methodology that formalizes the long-standing holistic evaluation of graduate student applicants that considers quality and trajectory in transcripts, research experience, personal contributions and goals, and letters of recommendation. Experience that would suggest success in a research environment, not simply formal research internships in academic labs, is considered carefully, for example, the experience of veterans or industrial experience.

Financial support for campus visits: The Department fully supports all admitted students for a campus visit where the students meet with faculty and other students and obtain a sense for the research environment and the overall climate. For several years (over 10) these visits have included a student-run discussion on diversity and climate on the second days of the visit. We will make additional effort to provide opportunities for incoming students to connect with groups on campus related to student life so that they can better understand the campus community.

Revisiting coursework: While retention and completion data does not immediately suggest biases against admitted students in the manner in which educational advancement takes place, the Department will revisit questions of whether core coursework negatively impacts some students over others.

Zoom Office Hours for prospective students: During COVID-19, our ability to be effective ambassadors for UC Santa Barbara while remote has improved. Our long-term plan is to increase engagement with students in the years before graduate admission to help mentor students on the classes, skills, and opportunities that will improve their opportunities for graduate schools. We will engage with the Materials/MRL-initiated organization Graduate Students for Diversity in Science (GSDS) to particularly reach out to local Cal States with highly diverse undergraduate enrolments to advertise our graduate program and help guide them through our application process.

Graduate Recruitment Weekend: We will pair admitted students with current students over email to give admitted students someone to freely ask questions ahead of the visit weekend. This is a

particularly effective community-building strategy for students from under-represented groups, especially when the admitted student is paired with a current student with whom they share something in common (race, gender, background, etc.). During the Graduate Student Recruitment Weekend, we will work with other College of Engineering departments to better welcome and support under-represented graduate students.

Climate and mentoring

Diversity of climate: Improving admission statistics for URM students is an important first step towards a diverse, equitable, and inclusive department. However, to ensure that these students have a positive and productive experience in our department, it is necessary to look critically at the existing culture to identify any potential barriers to this goal. More specifically, many URM students report feeling isolated, ignored, and discriminated against in a variety of forms both explicit and implicit. While UCSB has a robust infrastructure for reporting blatant acts of discrimination, many microaggressions fall outside of the purview of this system.

A crucial step towards creating a more equitable and inclusive Department is for the members of the department to educate themselves about other cultures and the barriers that URM students might face in academia and everyday life relative to their own experience.

Additionally, many people not classified as URM face microaggressions and feelings of “otherness”, including those identifying as AAPI and/or LGBTQ+ and those with disabilities. Many people outside of the AAPI community do not know or acknowledge the history of discrimination against Asian Americans or the barriers that this discrimination creates in academic institutions. LGBTQ+ students consistently report feeling pressured to suppress their identity and limit their expression, creating an uncomfortable and hostile work environment. Finally, we seek to understand how our department may exclude or inhibit those with disabilities from fully engaging with their (and our) community and work.

As an academic institution, we have a responsibility to create and maintain a departmental culture that is inclusive and welcoming to all. Being aware of shortcomings within our own department is the vital first step towards improving the experiences of the many under-represented groups within our department.

The existing departmental culture will be critically analyzed, and the Department will intentionally work to be more inclusive. This includes (but is not limited to), providing bias trainings for faculty, staff, and students, encouraging students to engage cross-culturally through shared community spaces, and actively seeking regular feedback from current students on the state of culture.

Departmental Climate Survey: To assess and continue to improve existing deficiencies and practices in the Department, we have been working with the Evaluation Program Coordinator of the CNSI, who has systematically been conducting surveys, and whose prior work ensured that excessive

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surveying and survey fatigue can be avoided. The goals have been to understand the climate with respect to the well-being of our students, to their needs for mentoring, and other kinds of support. We will periodically discuss the results of the surveys in a meaningful discussion within our community in order to use the results to chart a path forward using the data, beyond our other ongoing efforts. An immediate outcome of the survey is that students entering non-academic careers sometimes feel that they are insufficiently mentored for their places of work during the PhD program.

Making better use of cross-college ties for mentoring: Given the cross-disciplinary research in Materials and the many joint appointments across Departments, working together to better mentor the perforce small cohorts of underrepresented students make sense both from an organizational viewpoint but also from the viewpoint of scholarship. Simple effective strategies are social events that start at the beginning of the first year of graduate school and are supported throughout. As an example, the Materials department will work with other departments in the College of Engineering to host a coffee hour for first year graduate students later in the first quarter, where some faculty and more advanced graduate students are available to just hear how things are going and offer advice and support as needed. This will be followed up by additional social events throughout the year to keep the conversation going and keep a support system in place.

Graduate Student/Postdoctoral Group: Through the monthly town hall meetings during COVID-19, the Department recognizes that need to have a more formal means of communication with students. To this end we are developing a student/post-doctoral student group with representation across years in the Department. The mission of the group will be to represent student and post-doc interests in departmental affairs, including: to provide opinion on DEI issues facing the department, including bringing existing inequities to faculty attention; to solicit input from fellow students/postdocs; to communicate with department leadership, and to help advocate for positive change in our community.

Space for Improving Community. The Department unfortunately does not have meeting space that can be designated for student meetings at this time given the demands for office space. Note that Materials houses offices for students outside of the Department who are mentored by Materials faculty.

Department Mission Statement: The Department has developed a new mission statement that places stronger emphasis on the importance of diversity, its importance to the University and Department and its role in the workplace, not unlike the College statement quoted earlier. This statement will be further refined in consultations with the student/post-doc group and COE/campus guidance.

Improvements to Web Page: The Department is improving the navigability of the website so that the DEI landing page is arrived upon quickly. Also, we are collating the DEI resources and efforts

in the Department, the College, and across campus so that these can easily be found. This has also been something that our students have asked for in our Town Halls.

Code of Conduct: The Department hosts many events and is developing and posting a code of conduct for such meetings based on best practices recommended by the National Academies reports on inclusion, and in compliance with UC-specific rules. The Code of Conduct will be important for not only events and visitors but for department members as well. We will post this Code of Conduct on our website, alongside the existing UC Faculty Code of Conduct. We will inform current graduate students and faculty of its creation and review the Code of Conduct with new graduate students each year during orientation.

Recognizing Contributions with Awards: While students and postdoctoral fellows have traditionally performed a great deal of service in our department, we recognize that these efforts have not been previously recognized. To rectify this and to create a tangible benefit for what are traditionally viewed as thankless tasks, we are creating Service Awards to recognize the outreach, advocacy work, and mentoring efforts by students and postdocs within the department.

AAAS SEA Change: We advocate that UC Santa Barbara become a member of AAAS SEA Change, a program that provides support to academic institutions in “cultivating diverse campus communities that are truly equitable, accessible, and inclusive.” The program, which requires campus-level commitment, provides ongoing support and recognition for efforts, very much in the manner than the Athena SWAN program in the UK does, to create a diverse, equitable, and inclusive community which our department can positively contribute towards. Furthermore, the program also suggests guidelines and plans of action to improve all aspects of diversity, equity, and inclusion.

Undergraduate training and internships

Our Department teaches a small number of undergraduate courses providing interaction with undergraduate students. Our research groups do mentor large numbers of undergraduate students during the academic year and summer through various programs, *e.g.* NSF RISE, UC LEADS, LSAMP/CAMP *etc.* and through paid research positions.

We have generally encouraged these undergraduate students to attend graduate school outside of UC Santa Barbara to gain a broader view of science and the US. Many of these students attend highly ranked institutions across the country and are highly successful. We recognize, however, that some students may benefit from staying at UC Santa Barbara or within the UC system, and we remain open to this.

We are working actively with materials departments across the UC system to develop a strategy to create a network where promising students can understand opportunities with California. The Departments are working to compile list of programs that are not highly leveraged, such as UC LEADS, and inter-campus research experiences for undergrads enabled by the new NSF MRSEC

centers at UCI and UCSD. Additionally, we will extend this effort to the Cal States to develop networks across all institutions.

Postdoctoral diversity

The Department recognizes the ability to address the diversity of faculty in the US broadly through support of postdoctoral scholars who have a high probability of applying for faculty positions. The Department encourages these scholars to attend programs through the Materials Research Lab and CNSI/CSEP on professional development that our faculty are frequently speakers.

We internally advertise programs, such as the UC President's Postdoctoral Fellowship and the North American Materials Colloquium Series (NAMCS) and have a history of supporting applications to these programs. The Department will encourage faculty to advertise post-doctoral positions broadly to increase their pool of potential candidates. We note that this effort can be challenging given limitations that specific skills sets may be desirable for some projects.

Similar to the fundraising efforts described for graduate students, the Department will work with Development to establish a program comparable to Elings Fellows in CNSI with an effort to increase the ability to attract scholars who become the next generation of faculty. Models such as the Miller Fellowship at UC Berkeley exist that provide the inspiration.

Faculty Searches

The Materials Department has made serious strides in recent years in increasing the gender diversity in the faculty, and it is hoped that this will continue. In terms of underrepresented groups, the Department clearly needs a concerted effort, with help from the College.

The Department takes diversity training seriously for all search committee members, who are comprehensively advised on pervasive issues with implicit bias and the resources to avoid being influenced by them. Positions are widely advertised in the usual publications and professional societies. In addition, we will work to further these efforts by identifying additional organizations in consultation with a broad community of stakeholders in regard to the most impactful places to advertise searches. To better evaluate applications, we will adopt best practices and follow a uniform rubric as advised by University.

The Department has generally had a practice of targeting faculty searches in specific sub-disciplines relevant to the needs of instruction. This practice can limit the diversity of search pools relative to searches across broad areas. The Department will revisit this practice to determine how to best improve the diversity of the faculty through its long-range planning committee. The Department strongly supports and considers the addition of diversity statements to the applicant package.

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The Department will continue to encourage candidates from programs aimed at increasing diversity and academic excellence, such as the UC President's Postdoctoral Fellowship, to apply for positions. Conversely, UC Presidential Postdoctoral Fellows hosted by Department faculty have been placed across several Universities such as Columbia, Ohio State *etc.* We will also leverage our membership to the North American Materials Colloquium Series (NAMCS) to expand the faculty applicant pool. The Materials department has committed at least 50% of our Fall 2020 Materials seminars to showcasing these speakers. NAMCS is a highly selective series in its inaugural year that showcases diverse senior graduate students and postdoctoral scholars in the field of materials science and engineering from across North America.

The Department recognizes the need for role models for students for both academe and alternative career pathways in science. The Department worked closely with the student group *Graduate Students for Diversity in Science* to create the Dow Diversity lecture and to bring in faculty from underrepresented groups for multi-day visit. As GSDS has broadened its scope, we realize we cannot rely on that venue alone. To this end, we have modified our process for determining seminar speakers to a pool-based model that is known to increase diversity. In the first year of this practice, we have nearly achieved gender-parity in our seminars and as our pool increases, we expect to see increases in the overall diversity of the pool.

When recruiting new faculty, the Department will ensure they are introduced to organizations and/or individuals with whom they may share interests during their campus visit as a way of demonstrating that UCSB is a welcoming environment and helping them build community before arriving (and that they are likely to find community once they get here). We will offer these meetings when creating their schedule, in case they choose to decline, or in case they want to ask for meetings with specific groups/individuals.