Columbia Engineering
Diversity, Equity, and Inclusion (DEI) Commission Report
(DRAFT, April 2021)

Diversity, Equity, and Inclusion (DEI) Mission and Vision

DEI Mission

Columbia Engineering is committed to advancing and nurturing a diverse, equitable and inclusive climate for all faculty, students, and staff. Driven by our core mission, Engineering for Humanity, we believe that true innovation is only possible when the field of engineering draws on the talents, perspectives, creativity, and intellectual richness of a diverse community. To this end, the School prioritizes creating avenues for equitable participation from all groups, especially those historically under-represented in our Disciplines.

To advance this mission, in July 2020, Dean Mary C. Boyce announced the formation of the SEAS Commission on Diversity, Equity, and Inclusion. With representation from faculty, students, postdoctoral researchers, and administrative staff, the commission is further supported by leadership of key functions of the School and the University. The charge of the Commission is to engage with the SEAS community to develop a Strategy and Action Plan for propelling diversity, equity, and inclusion across all areas within SEAS, with an emphasis on the talent pathway for engineering and applied science so critical for advancing engineering education, research, innovation and impact.

DEI Vision: Challenges and Opportunities for Change

We are fortunate to have the privilege to learn from one another, and to study, work, and live together in such a dynamic and vibrant place as Columbia, and in the great city of New York. As a community, we share a collective commitment to create and foster an open and collegial environment of equity and inclusion, and to recruit and advance the diversity of talent in our school, as we work to bring an engineering impact on humanity.

When we reflect on our community, we see wonderful signs of progress. To advance our diversity, inclusion, and equity goals, we continue to implement best practices, execute strategic actions, and launch major initiatives. Our Diversity Equity Inclusion website showcases the depth and breadth of programs and activities across Columbia Engineering, from K-12 outreach to activities of undergraduate and graduate student affinity groups, from faculty-initiated education and research programs to collectively raising awareness of all we do and all we need to do going forward.

Significant efforts targeted at building partnerships with Historically Black Colleges and Universities (HBCUs) and Minority Serving Institutions (MSIs) have emerged, including the SURE program in partnership with Amazon, which will bring about 30 underrepresented undergraduate scholars to Columbia this summer. This program, along with those already in place at SEAS (Bridge-to-PhD, HK Maker Lab, Summer@SEAS, Path to PhD, NSF REUs and many others) are key elements in integrating DEI into our research and education, and will be instrumental in cohort building and ensuring a productive and enriching experiences for underrepresented group (URG) fellows, with long term impact anticipated on the student and faculty Pipelines.

Over the past decade, the School has made tremendous gains in gender balance, reaching gender parity at the undergraduate level with the Classes of 2023 and 2024, more than doubling its number of female faculty. This is especially remarkable given that across the nation, women earn roughly 21% of undergraduate degrees in engineering and engineering technologies (National Center for Education Statistics). In addition, our incoming Class of 2024 is made up of more than 30% URG undergraduate students. Seeking to build on this success, the Commission is now looking to realize similar gains across all demographics.

While much progress has been made, we recognize that challenges still persist in expanding the diversity of our graduate student body and our faculty, as well as further enhancing our culture of inclusiveness and advancement across the School and integrating DEI into our mission of research, education, and innovation. We also understand that by working not just with our community but also together with other institutions of higher learning (especially HBCUs and MSIs), as well as industry and community partners, we can help build on the momentum for change in a way that not only fosters greater equality for our school but also extends far beyond it.

Opportunities

As a School and community embedded in New York City, with a vast global reach, we have the opportunity and obligation to create an atmosphere of equity and inclusion that reflects the diversity of our home. From addressing racial disparities in education and research, to confronting systemic anti-Black racism, to supporting the advancement of women and marginalized groups, to celebrating and expanding the ethnic diversity of our community, we are united in our obligation to build a more welcoming community of engineers and applied scientists.

As protests and calls for actions over anti-Black racism and other racial discrimination spread around the world, our society found itself confronting long-standing inequalities with new energy. We likewise find ourselves at an inflection point, one that presents us with tremendous opportunities to make even greater gains in advancing an inclusive and diverse environment: Columbia Engineering has an opportunity to improve academic partnerships and increase access for a more diverse student applicant pool; to apply more strategic DEI principles to recruiting practices and to mentoring faculty; to implement community-wide support throughout the School environment; and to support our community with guidance on integrating DEI principles deeper into research, teaching, and innovation.

Commission Overview

Mandate

The Commission is charged to engage with all constituents in the School of Engineering and Applied Science to identify challenges and opportunities in DEI and devise strategies and an action plan for advancing the SEAS DEI mission in research, education and community impact.

Commission membership

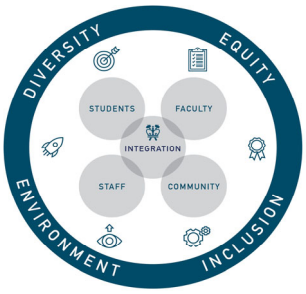
This Commission is jointly led by SEAS Senior Executive Vice Dean Shih-Fu Chang and SEAS Chair of Faculty Promotion, Tenure and Advancement Helen H. Lu. The Commission members, nominated by departments and school administrative units, were drawn from every cohort across Columbia Engineering, including faculty, students, postdocs, staff, and administrative officers, embodying a comprehensive representation of our stakeholders and communities (see appendix 1). In addition to commission members, administrative support officers – ranging from student admissions to student life, provided valuable context and resources critical to the relevant discussions and actively contributed to the work of the commission.

Strategic Planning and Community Engagement Process

In order to arrive at the set of concrete recommendations presented in this report, the Commission and the School conducted an extensive deliberative process. Together, the Commission's work is based on a bottom-up process that not only drew on input

from Commission members, but also incorporated extensive feedback from stakeholders across the community, including feedback from DEI awareness workshops in every department, informal conversations with the leadership of several student organizations, interviews with Columbia University's Office of Postdoctoral Affairs, discussions with Alumni and the Board of visitors, as well as input from annual surveys conducted by the Engineering Graduate Student Council with members of the student community reflecting on student life. Going forward, community conversation and feedback will continue in order to solicit new input, review priorities, and discuss implementation strategies and status.

Priority Areas for Impact



After reviewing this extensive input, Commission members identified four clear priority areas of impact: strengthening the pipeline for student and faculty recruiting would lead to a more diverse and inclusive environment, while in turn, prioritizing a welcoming culture for students of all backgrounds would attract more talent to the School and aid in recruitment. In the same vein, better integration of DEI across research, education, and innovation would create the type of infrastructure to support all of our DEI efforts.

Student Recruiting and Pipeline

The student recruiting and pipeline group focuses on educating a diverse student population. To fulfill its mission in achieving academic excellence and cultivating a vibrant and welcoming environment on campus, the group explores ways to recruit, select, yield and support students of underrepresented backgrounds to enable their long-term success.

Faculty Recruiting and Pipeline

The faculty pipeline, recruiting, and mentoring group is focused on cultivating inclusivity in several primary areas: the faculty pipeline, active search practices, and on-going support for recruitment and retention efforts. We seek to identify current resources as well as recommend new initiatives and areas for growth based on best practices at Columbia and peer institutions. Fostering a diverse and equitable faculty community is imperative to producing groundbreaking research, leading improvements in engineering and applied science teaching and learning, and modeling Columbia Engineering's mission of Engineering for Humanity.

Environment/Culture/Climate

This group's mission is to identify needs and opportunities to create an inclusive environment and welcoming, supportive climate for diverse students, faculty, researchers and staff at Columbia Engineering. Cultivating such a climate, in addition to being consistent with our values, is essential for the retention and long-term success of members of the university community from underrepresented groups. The group identifies resources currently available and accessible to the different constituencies, and develops recommendations for future actions based on this assessment, best practices across campus and at peer institutions, and additional feedback from cohorts.

Integration into Education, Research, Innovation

This group aspires to intentionally introduce diversity, equity and inclusion issues into Columbia Engineering's education, research, innovation, and outreach activities through several avenues: create explicit, tangible, and validated materials on training faculty, staff, and students on integration of DEI into practice; conduct a rigorous assessment and evaluation of diversity practices to demonstrate their efficacy and to promote continuous improvement; and create incentive and accountability structures to promote active engagement, beyond just awareness, with DEI by students, faculty, and staff.

At the outset, the Commission gathered together for a DEI awareness workshop. To help lay a deeper foundation for this work, DEI workshops were conducted for each of its nine departments, as well as the Dean's office. The workshops included customized questions designed by Commission subgroups and customized according to each department's DEI needs and priorities. Departments were asked to consider many questions related to needed resources, areas of improvement, and how best to build an inclusive environment. These well-attended workshops help provide very relevant and extensive input for the commission, as well as the departments, and the school.

After each subgroup engaged with their respective communities and studied the challenges and opportunities in their key area, they distilled their findings into a series of concrete recommendations targeted to address both short term and long term concerns. We invite you to review the full report by each subgroup in the sections that follow this summary report.

DEI Strategic Goals and Action Plan

Using the four areas of impact as a framework and synthesizing the priority group recommendations, **three critical conceptual pillars, each encompassing several key DEI elements, have emerged and will anchor our DEI strategy:**

- Talent (Recruitment, Retention, Mentoring, Advancement)
- Environment and Culture (Awareness, Visibility, Community/Engagement, Integration)
- Accountability and Recognition (Recognition, Incentivization, Assessment, Accountability)

These pillars are embedded into six distinct goals outlined below that will guide our DEI Strategic Action Plan for the next five years. A list of action items, consolidated based on the direct recommendations from subgroups, are listed below and mapped to one or several distinct goals.

Goal 1: Proactively Recruit URG Students and Faculty to Columbia Engineering
Success in building a diverse community begins long before the hiring and admissions process. Recruitment and targeting the best candidates through partnerships, programs, and best practices are foundational to addressing DEI at all ranks and levels for faculty and for our students.

- Students
  - Create hybrid (virtual and in-person) programming for recruitment of undergraduate students while expanding and increasing faculty participation at the Columbia Engineering Experience (CE2)
  - Create and leverage best practices in the recruitment of undergraduate URG students to School (e.g. 3-2 programs) and programs (e.g. Summer@Columbia Engineering, SURE, REUs)
  - Increase Columbia Engineering presence at national/regional affinity organization conferences (e.g. NSBE) and admissions fairs
  - Partnerships with HBCUs and MSIs to enhance recruitment of graduate students and postdoctoral fellows
  - Expand Bridge-to-PhD program through fundraising and integrate this pathway into the overall doctoral admissions process
  - Create fellowship opportunities (e.g. professional development, need based scholarships) for URG students pursuing graduate degrees, through fundraising or training grants
- Faculty
  - Ensure faculty search committee is inclusive and well trained in DEI practices
  - Expand and build education and research partnerships with HBCUs and MSIs to enhance the pathways to PhD and academia
  - Intentionally leverage diversity faculty hire initiatives across the university and beyond (e.g. Target of Opportunity, STEM Cluster Hiring)
  - Pursue creative and best practices in the search for and recruitment of URG candidates in advertised faculty positions (e.g. interdisciplinary/open rank/field searches, broad search descriptions, DEI awareness training of search committees, search committee membership and accountability, require DEI statement by applicants)
  - Consider transitional assistant professorships and research scientists in fields where this is a pathway to professorship, with retention possibilities
  - Organize, in cooperation with peer institutions, Rising Star workshops covering different areas and maintain close engagement beyond workshops to build a robust junior faculty pipeline

Goal 2: Create and Adopt Best Practices in Retention, Mentoring and Advancement of Faculty, Students and Staff
Mentoring and clear pathways to promotion and advancement are key to retaining members of our community. We will build on our formal mentoring mechanisms, incentives, and strong networks of support, both structural and financial, to nurture and develop our talent.

- All Students
  - Create cohorts and provide peer-mentoring and role models for URG students across all levels (BS, MS, PhD) using ambassador programs and peer mentoring
  - Expand and promote visibility of our affinity groups (NSBE, SHPE, SWE, GradSWE, qSTEM, etc.)
  - Explore opportunities to create academic support infrastructure (e.g., lending libraries, expanded research opportunities, curriculum review/revision, etc.) to nurture homegrown talent at all levels
- Undergraduates
  - Expand tutoring and advising services throughout all years of academic training for students
  - Fundraise and review financial aid model for undergraduate students, e.g. financial aid in the summer
- Doctoral Students
  - Provide training and mentoring programs and networks for doctoral students to explore advanced career pathways in academia and industry
- Master's Students
  - Expand BS/MS combined degree programs/MS express program to harness home grown talent for the Master's program
  - Fundraising for financial aid for MS students
- Faculty:
  - Enhance and further formalize our mentoring mechanisms and integrate with faculty advancement and promotion for both junior and mid-career faculty at Columbia Engineering; have more accountability of department chairs on mentoring, including DEI considerations for promotion
  - Synergize with other university STEM programs/schools to build cohorts and mentor network for URG faculty
- Staff
  - Create peer mentorship programs across all cohorts, including building and expanding cohorts based on professional responsibilities or culture affinity

Goal 3: Raise Visibility, Enhance Community Engagement and Build Awareness that DEI is Central to School Mission
A sustainable DEI program will depend on the commitment of our community and transparency in our efforts. Prioritizing communication, customizing training, highlighting our successes, articulating our challenges, and increasing opportunities for learning and engagement will support and advance all other goals of the program and ensure accountability.

- Conduct regular DEI training and customize it to audience and field
- Prioritize communication and transparency on DEI matters impacting the school
- Engage with alumni to highlight possible career pathways for graduates
- Incorporate DEI awareness into the faculty recruiting communication and application process, as well as promotion considerations
- Offer opportunities for practical DEI training through courses, internships or workshops
- Increase visibility by showcasing alumni and current students contributing to DEI activities
- Enhance both cohort-based and cross-cohort programming for students in order to facilitate better communication and understanding along the pathway

Goal 4: Integrate DEI Considerations into Engineering Research, Education, and Innovation
As three pillars of our school mission, research, education, and innovation are primary areas where DEI must be deepened and elevated. The Commission seeks to leverage best practices and find new avenues for intentional integration of DEI, particularly in research, teaching and innovation.

- Create seminar series, jointly with faculty and staff, on how to incorporate DEI in research, teaching, innovation and outreach
- Integrate DEI awareness and impact of research, technological developments on potential fairness, bias, ethics or unintended consequences as well as on challenges with societal impact into research programs
- Develop relationships at a faculty level and actively partner with HBCUs and MSI, including seed grants for joint research projects
- Increase research opportunities for URG students through summer research programs (REU with HBCUs/MSIs, Summer@Columbia Engineering) and work study programs
- Create professional development activities and cross-cohort programming for staff

Goal 5: Recognize and Incentivize DEI Efforts at Columbia Engineering
Without incentives, institutional support and adequate resources, DEI efforts are unlikely to succeed in the long-term. We seek to recognize and reinforce both individual and group efforts at building a truly diverse and inclusive community.

- Provide institutional support and resource allocation for faculty and staff engagement with and participation in DEI activities
- Recognize and emphasize the benefit of engaging in DEI activities in Promotion and annual review for faculty and staff
- Create service awards that recognize efforts to advance DEI for students, faculty and staff
- Provide concrete resources (e.g. seeding grants, design challenges, salary offset, teaching relief) for faculty and students to create programming and engage in DEI activities

Goal 6: Continuously Assess Progress at All Levels in Accountability and Achieving DEI Mission
As we implement the recommendations of the Commission, we will also develop mechanisms to measure and assess progress on our goals and uncover roadblocks as well as opportunities.

- Develop specific DEI strategic plans such as Broader Participation Plans at various levels (lab, department, and School)
- Review and assess existing resources and opportunities for potential DEI topics
- Appoint a leadership position responsible for orchestrating data collection and assessing progress

Conclusion

While identifying opportunities and goals has been an invaluable and enlightening process, the Commission's work continues and the urgent task of implementation is just beginning. It is part of our DNA as engineers and applied scientists to focus on solutions within real-world constraints. This approach, coupled with our Columbia Engineering for Humanity vision, will guide our actions and analysis going forward. 2020 brought many longstanding gaps and inequalities in both education and society at large to greater visibility, forcing many institutions to think more deeply about current practices and processes. With the collective weight of faculty, students, and staff behind the DEI Commission, we are optimistic in our ability to address barriers to DEI adoption and make progress on the steps necessary to create a more inclusive culture and community at Columbia Engineering.

Appendix 1. Commission Membership

Commission Co-Chairs:
Shih-Fu Chang Senior Executive Vice Dean, SEAS, Richard Dicker Professor
Helen H. Lu Chair for Faculty Promotion, Tenure, and Advancement, SEAS, Percy K. and Vida L. W. Hudson Professor of Biomedical Engineering

Commission Members:
Sai Mali Ananth Graduate Student in Operations Research, SEAS, EGSC (Student subgroup co-chair)
Diana Carranza SEAS, Class of 2021, Chemical Engineering, ESC
Augustin Chaintreau Associate Professor of Computer Science (Integration subgroup co-chair)
Pam Graney Postdoctoral Research Scientist, Biomedical Engineering
Christine Hendon Associate Professor of Electrical Engineering (Student subgroup co-chair)
Aaron Kyle Senior Lecturer in Discipline of Biomedical Engineering (Integration subgroup co-chair)
Qiao Lin Professor of Mechanical Engineering
Hoe Ling Professor of Civil Engineering
Faye McNeill Professor of Chemical Engineering and of Earth and Environmental Sciences (Environment subgroup co-chair)
Aimee Moses Graduate Student in Applied Mathematics, SEAS, EGSC
Angel Njoku SEAS, Class of 2022, Operations Research; Engineering Management Systems, NSBE
Alissa Park Lenfest Earth Institute Associate Professor of Climate Change, Dept. Earth & Environmental Engineering
Elizabeth Strauss Associate Director, Professional Development and Leadership, SEAS
Cliff Stein Professor of Industrial Engineering and Operations Research and of Computer Science (Faculty subgroup co-chair)
Wendy Villa Director of Finance and Administration, Department of Electrical Engineering
Renata Wentzcovitch Professor of Applied Physics and Applied Mathematics (Faculty subgroup co-chair)

Admin Groups:
Yannick Brookes Assistant Dean of Graduate Student Affairs, SEAS
Leora Brovman Senior Associate Dean of Undergraduate and Graduate Student Affairs, SEAS (Environment subgroup co-chair)
Cecily Castle Leadership Giving Officer, SEAS
Mindy Farabee Associate Director of Communications, SEAS
Emily Ford Director of Outreach Programs, SEAS (Integration subgroup co-chair)
Gabby Gannon Director of Graduate Admissions, SEAS
Cristen Kromm Dean of Undergraduate Student Life, Columbia College and Columbia Engineering
Joanna May Associate Dean and Director of Undergraduate Admissions, Columbia University
Neil McClure Sr. Associate Dean of Faculty Affairs and Chief Administrative Officer, SEAS
Barclay Morrison Vice Dean of Undergraduate Programs, SEAS; Professor of Biomedical Engineering
Kwame Osei-Sarfo Bridge to the Ph.D. Program in STEM, SEAS/Office of Faculty Advancement
Andrew Plaa Dean of Advising, Columbia College and Columbia Engineering

Ex Officials:
Mary Boyce Dean of SEAS, Morris A. and Alma Schapiro Professor
Soulaymane Kachani Senior Vice Dean, SEAS; Vice Provost for Teaching, Learning, and Innovation

Appendix 2a. Student Priority Group Report Summary

Challenges

The challenges for student recruitment and pathways/pipeline vary depending on the student population.

- BS -Challenges for BS students include lack of access to information and resources when choosing a major/career and support resources to succeed in advanced technical / engineering courses.
- BS→ MS - Challenges with recruitment and pipeline for students pursuing a fifth year are funding source and how best to ensure that students with diverse backgrounds are prepared for graduate school (e.g. research opportunities).
- MS - Increase funding opportunities since federal financial aid is not available for MS students.
- PhD - Increase the applicant pool of diverse candidates.

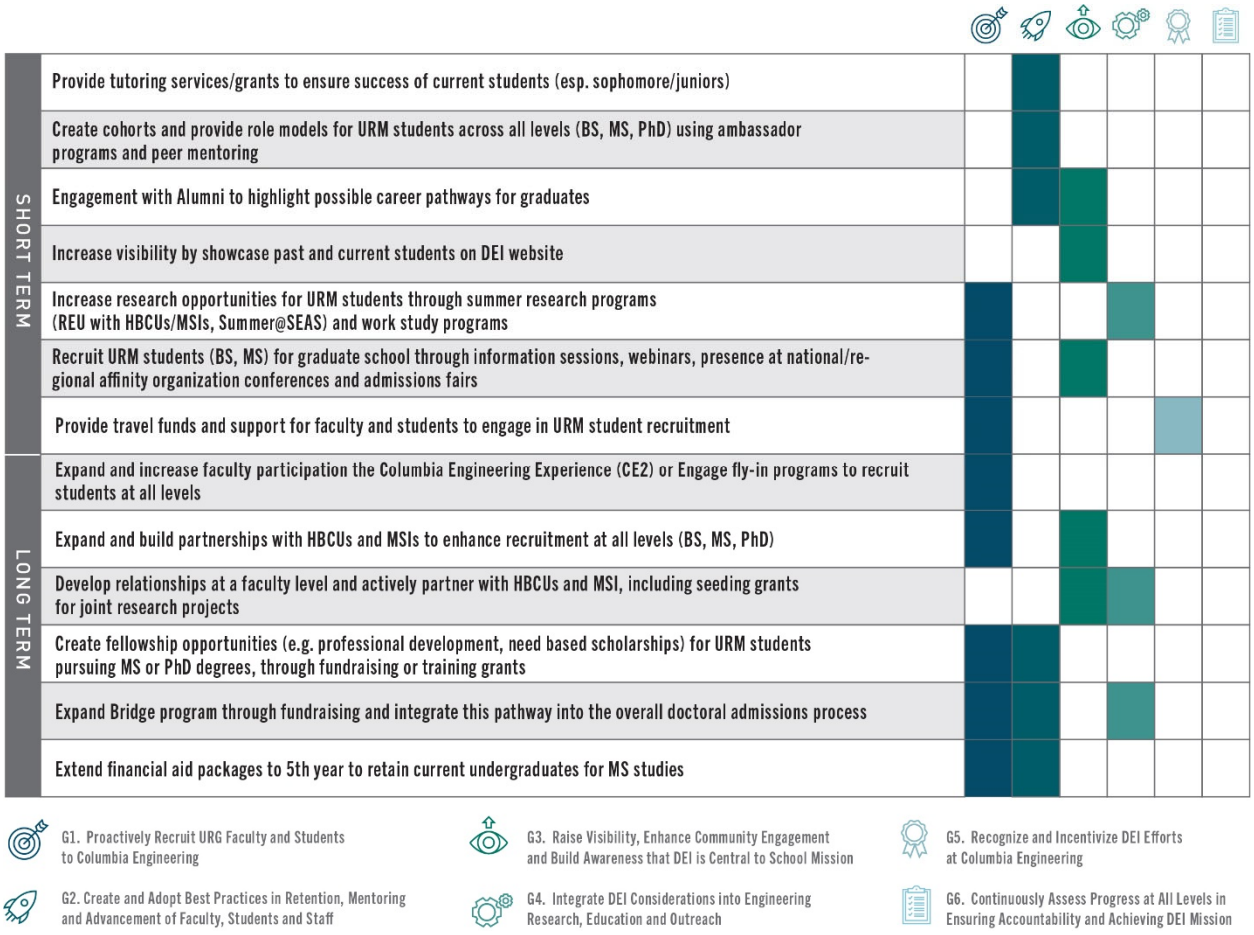
Community Input

- Reports of DEI workshops with all departments
- Discussion with undergraduate student leaders

Resources needed/identified

- Targeted DEI fundraising to expand Bridge-to-PhD program and provide resources for partnership with HBCUs, and financial aid for MS students, diversity fellowships, Professional Development Scholarship

Recommended Action Plans



Appendix 2b. Faculty Priority Group Report Summary

Challenges

There is a deep need to address underrepresentation of BIPOC and women in the faculty body with sustained, creative and concerted efforts to attract more diverse applicants. Greater attention must be paid to mentoring URG faculty and supporting the DEI work of current faculty members. Progress in addressing underrepresentation must be two-pronged, with active hiring across all levels while retaining current faculty with strong internal support. We also need to address the pipeline issues and issues of process, including how search committees are formed and run to ensure equity in candidate evaluation.

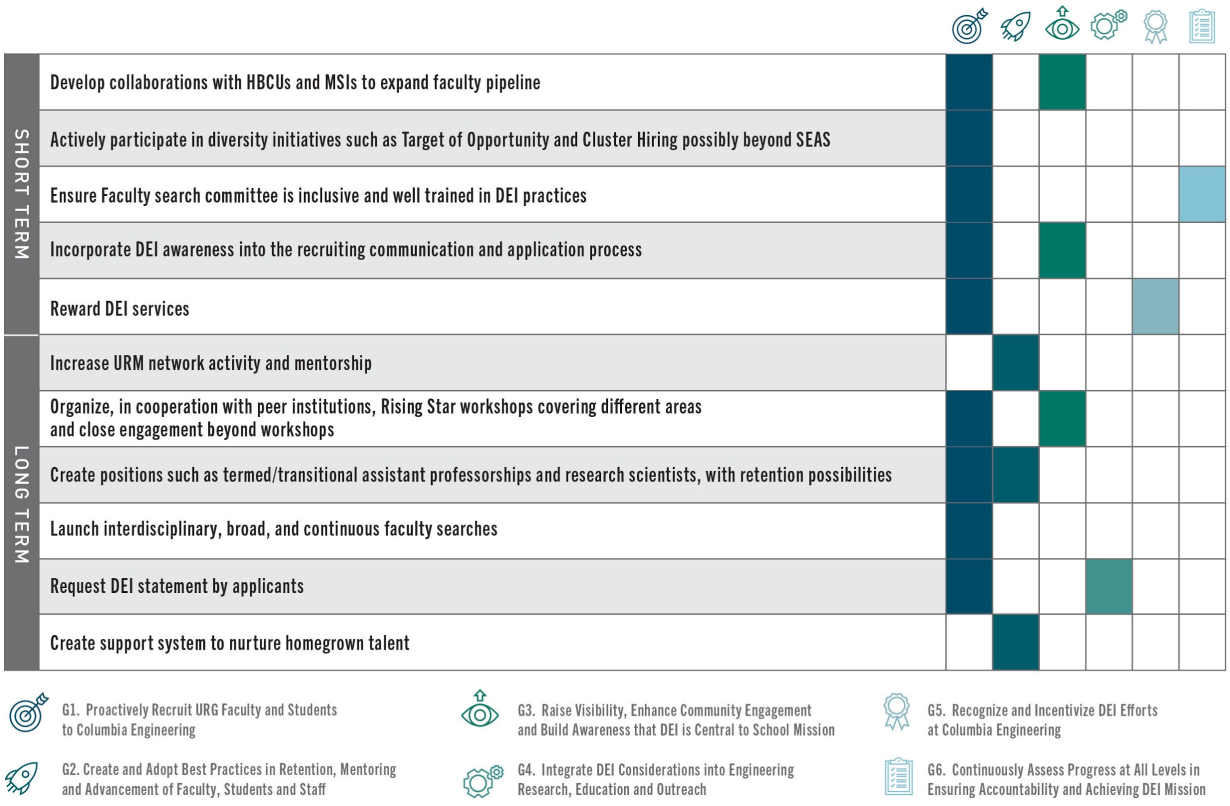
Community Input

- Reports of DEI workshops with all departments
- Discussion with stakeholders

Resources Identified/Needed

- Utilize existing Best Practices and Resources (both internal and external)
- Reward DEI activities and ensure widespread participation that extends far beyond URG faculty
- Clearly communicate SEAS' commitment to DEI
- Increase flexibility and creativity in recruitment overall and specifically in types of positions

Recommended Action Plans



Appendix 2c. Environment Priority Group Report Summary

Challenges

Students, faculty, and staff from underrepresented groups benefit from culturally specific support, such as peer mentoring within affinity groups, but community-wide support can also lead to a more inclusive environment. Sustained support, not just during orientation period/early career stages, is needed for all cohorts during their time at Columbia.

The needs for support are layered and cohort-specific. Training is needed to educate community members on creating and maintaining a respectful environment on campus and in the lab and classroom. Pathways for communicating, reporting and holding the community accountable for DEI concerns and incidents need to exist and be transparent. Communication from leadership to the community surrounding DEI-related current events should also be intentional and coordinated.

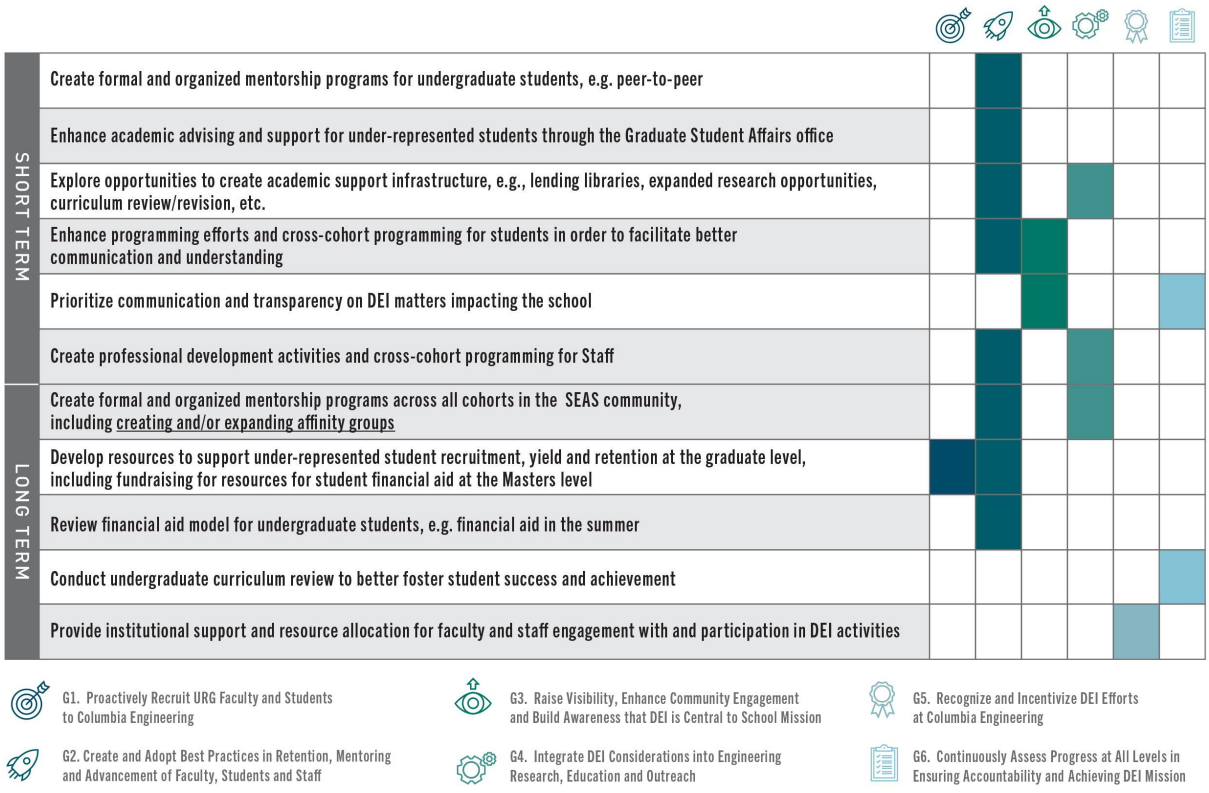
Community Input

(1) Reports of DEI workshops with all departments (2) consultation with the CU Office of Postdoctoral Affairs (3) the Engineering Graduate Student Council survey (4) diversity data for staff provided by SEAS.

Resources needed/identified

- Financial aid for Undergraduate and MS students
- DEI student recruitment/retention
- Mentorship programs for all groups
- Incentives for faculty/staff in support of DEI activities
- Cohort building

Recommended Action Plans



Appendix 2d. Integration Priority Group Report Summary

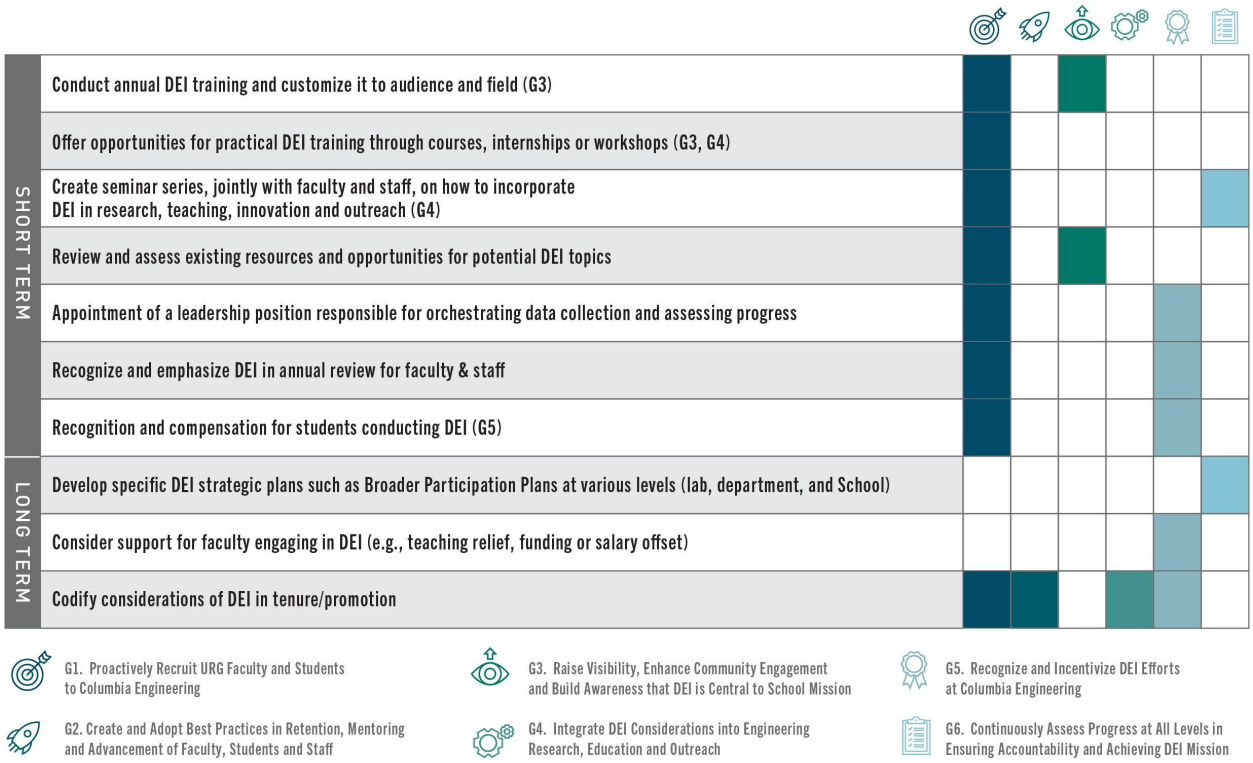
Challenges

There is a lack of knowledge of how to integrate DEI considerations into the various activities of the School and motivation to enact DEI initiatives. Department's DEI efforts are primarily via outreach; it is rarely a part of research, teaching, or innovation. Related to the lack of intentional integration of DEI, it appears that there is little incentive for faculty or staff to work on these efforts.

Community Input

- Reports of DEI workshops with all departments
- Discussion with stakeholders
- Resources needed/identified
- Funds for incentivizing faculty, students, and staff
- Dean's office position for DEI
- Methods for assessment and evaluation

Recommended Action Plans



Appendix 3a. Student Recruitment and Pathways Priority Group Full Report

Members

Sai Mali Ananthanarayanan- Co-Chair (PhD Student in Operations Research, SEAS, EGSC)
Gabrielle Gannon (Director of Graduate Admissions, SEAS)
Christine Hendon- Co-Chair (Associate Professor of Electrical Engineering)
Qiao Lin (Professor of Mechanical Engineering)
Joanna May (Associate Dean and Director of Undergraduate Admissions)
Kwame Osei-Sarfo (Director of the Bridge to the Ph.D. Program / Office of Faculty Advancement)

Mission Statement

"The mission of the School of Engineering and Applied Sciences at Columbia University is to educate a diverse student population. To fulfill its mission in achieving academic excellence and cultivating a vibrant and welcoming environment on campus, our goal is to **recruit**, **select**, **yield** and **support** students of underrepresented backgrounds to enable their long term success."

Keywords of the mission are bolded. This committee has outlined proposals to address these goals. We want a diverse student body. To achieve that, we need to recruit, select and yield a diverse student body because we believe having a diverse community will lead to academic excellence. Once here, we aim to educate and support students, to enable their long term success. This embodies the recruitment and pipeline/pathways goals of this committee.

Summary of Challenges in Priority Areas:

- **Current Status Undergraduate Student Body Profile and Recruitment**

  At the undergraduate level, combining statistics from CC & SEAS the Domestic ethnic diversity[1] within our student population is 15% African American, 32% Asian or Pacific Islander, 20% Hispanic, 3% Native American, 54% White, and 2% Unknown. The Gender distribution is 51% female and 49% male, where the Columbia Engineering Class of 2024 is 51% female. Geographically all 50 states are represented and 70 foreign countries are represented. 17% are first generation college students and 17% receive Pell Grants.

  For comparison to peers, MIT[2] has domestic ethnic diversity of 11% African American, 42% Asian or Pacific Islander, 14% Hispanic, 1% Native American, 39% White, and 2% Unknown, and gender distribution of 49% female and 51% male. Harvard[3] has a domestic ethnic diversity of 15% African American, 24% Asian or Pacific Islander, 13% Hispanic, 2% Native American, and gender distribution 49% female and 51% male.

  To aid in recruitment, below are a list of undergraduate recruitment programs and events: Columbia Engineering Women's Forum; Multicultural Recruitment Committee Open House; Columbia Engineering Experience (CE2); Partnerships with CBOs (QuestBridge); Visits to targeted high schools; Targeted communication to underrepresented students; 'Perspectives on Diversity' admitted student program.

[1] https://undergrad.admissions.columbia.edu/classprofile/2024. Note: US Citizens and Permanent Residents, as self-identified on the application. Total exceeds 100% because students may indicate more than one race/ethnicity.
[2] https://mitadmissions.org/apply/process/profile/
[3] https://college.harvard.edu/admissions/admissions-statistics

- **Current Status Graduate Student Body Profile**

  As of Fall 2020, the Morningside Graduate & Professional Schools[4] average 7.3% (711/9,627) Black students among domestic students. Engineering (SEAS) has the lowest percentage of (domestic) Black students (3% ; 33/1,093) among the schools. Engineering contributes 4.6% of the Black student population in the Morningside Graduate schools despite making up 11.4% of the domestic student population.

  For comparison to peers, in 2016, Black students were 5.1% of all domestic graduate engineering students[5] (we are currently at 3% in 2020). Columbia had the 2nd lowest percentage of degrees awarded[6] to Black graduate engineering students (1.3% of domestic students) of the Ivies only following Harvard (1.1% of domestic students).

  To aid in recruitment, below are a list of affinity organizations and conferences that Graduate Admissions currently attends: NSBE: National Society of Black Engineering; SHPE: Society of Hispanic Professional Engineering; BEYA: Black Engineer of the Year Awards; AUCC: Clark Atlanta University, Morehouse College, and Spelman College; Tapia: The Richard Tapia Celebration of Diversity in Computing Conference, in conjunction with the Center for Minorities and People with Disabilities in IT. Other events include: Leadership Alliance, California Diversity Forum, SACNAS: Society for Advancement of Chicanos/Hispanics and Native Americans in Science, ABRCMS: Annual Biomedical Research Conference for Minority Students.

- **Summary of challenges**

  The challenges for student **recruitment** and **pathways/pipeline** vary depending on the student population. For students pursuing a bachelor's degree, challenges were mainly identified within the pipeline/pathway for students pursuing bachelors degrees within SEAS. These include access to information and resources when choosing a major/career and support resources to succeed in advanced technical / engineering courses. Challenges with recruitment and pipeline for students pursuing a fifth year are ensuring that students with diverse backgrounds are prepared for graduate school (increase research opportunities) and have funding to pursue a fifth year at Columbia. The challenge for the MS programs within SEAS is to increase funding opportunities since federal financial aid is not available for MS students. The challenge for the doctoral programs within SEAS is to increase the applicant pool of diverse candidates. Across all programs, increasing the interaction between students and mentors or role models will aid in achieving increased recruitment and pathway goals.

Summary of Community Input

Community input was solicited in two ways. The student recruitment and pathways committee outlined four questions for the departmental DEI workshops and discussions. The questions were: 1) Are there any pathways to STEM/Engineering programs that you are aware of from national societies and professional organizations? 2) How can we improve approaches to reach out to prospective URM applicants for our undergraduate and graduate programs? How can we increase awareness? 3) Do you have thoughts as to why we do not have more URM students applying to our graduate programs (MS and PhD)? 4) Where do you think we have retention or recruitment problems along the educational pathways towards a career in your discipline (i.e. Mechanical Engineering, Electrical Engineering, Applied Physics, etc)? 5) Are there any particular departmental programs in place for supporting undergraduate and/or graduate students that you think should be replicated across all SEAS departments? Why?. Feedback from the department DEI workshops are summarized within the table below.

[4] https://opir.columbia.edu/sites/default/files/content/Statistical%20Abstract/opir_enrollment_ethnicity.pdf
[5] https://ncses.nsf.gov/pubs/nsf19304/digest/enrollment#graduate-enrollment
[6] http://profiles.asee.org/profiles/8224/screen/28?school_name=Columbia+University

Community Input from meeting with Undergraduate Student Leaders	
Path to Columbia "Visit Day to campus was a highlight"; "Many friends did not think about CU as an option, only state schools" **Retention and Sense of Belonging** - Few peers from home state for the network. - "Playing field is not equal after the first year, a common misconception" - more support welcome for sophomores/juniors for a better academic experience. **Information flow:** - Students expressed interest in programing during freshman year to gain more information about how majors help with career paths and access to talk with alumni and upperclassmen. - Announcements on programming sponsored by individual departments are sent to students who are within that major. Students expressed interest in a central place where they can learn about department sponsored student events.	**Mentoring resources** - Affinity groups have developed mentoring programs, such as events for developing 4 year plans. - Fostering a junior to senior program within the department to bridge academic and scheduling gaps (e.g. Mechanical Eng. pilot program this year). -Students expressed interest in increased faculty involvement and collaboration with student groups, to help with passing along institutional knowledge to new student group leaders. **Better support for existing resources** - Students expressed that they are catching up to be competitive for research and internship experiences. This includes extra math classes, software or programming languages.

From initial reports within the DEI commission weekly meetings, the feedback received was that the majority of the participants within the departmental workshops were faculty, staff, and graduate students. Our committee therefore decided to host a meeting with undergraduate student leaders from on-campus affinity groups to solicit their feedback. The meeting was held during the evening on December 11, 2020. The questions brainstormed by the committee were: 1) We will like to know more about your path to Columbia. What things were important to you when applying to colleges? 2) Feelings on retention and belonging. What has been a great support for you? 3) Mentoring structure 4) Are there programs that you think can be better supported by the school of engineering? 5) Do you have any suggestions for a DEI town hall? A summary of the feedback from the student leadership meeting is within the table below.

Community Input from department DEI workshops held in Fall 2020	
Barriers to Recruitment & Retention: - **Socioeconomic status and funding** can discourage URM MS students, need for more paid opportunities. - **Cost** of higher education vs entering the workforce. - **GRE** is expensive & unfamiliar. - **Lack of representation** of URM in faculty, postdoc & student bodies (sense of belonging).	**Improved Recruitment/Outreach:** - Engage **alumni & current URM students** (incl. campus organizations e.g. NSBE) in recruitment/outreach. - **Provide incentives** for participation of faculty, students & alumni in recruitment/outreach. - **Combined (3-2) plan affiliate schools** should include HBCUs, MSI, & women's colleges: better recruitment.

Opportunities and Action Plan

Our action plan is divided into short term, medium term and long term goals. It is further divided by student group (undergraduate, BS—>MS pathway, MS, and doctoral students). This organization was implemented because each student population has unique needs. In addition, when considering implementation the staff and support within the school and university are also organized by student populations. These tables summarize the topics and suggestions that came up within committee meetings and from soliciting feedback from our community. For each topic, current activities are described, suggestions for enhancements are identified and an outline for necessary resources are provided.

- **Short term Goals/Proposed Plans**

Undergraduate (BS)			
Topic	**Current Activities**	**Suggestions for enhanced activities**	**Necessary resources**
Enhanced tutoring for retention & better academic experience	Most of the tutoring services are for first years.	Identify upperclassmen who can tutor sophomore/junior courses.	Faculty and current student participation, funding for tutoring.
Role models and choosing a **career direction**	Affinity groups outreach to industry	Webinar panels with alumni from diverse backgrounds to showcase career paths of alumni	Alumni volunteers and staff to organize
Funding support for **conferences**	Inequity in dept wise funding; Resources unclear for students.	Wider access for funding information, support for other conferences (e.g. AfroTech, Grace Hopper).	Consolidate resources; Scholarship at dept level for conferences across the board.
BS -> MS pathway			
Need to increase number of **URM students conducting research**		Increase participation within summer at SEAS research programs, such as SEAS SURE program.	Advertise summer research opportunities; Partner with Leadership Alliance.
Balancing research and work study		Advertise to current undergraduates; Students can use work study to do research with a SEAS faculty member.	Online posting of virtual research positions by faculty .
MS pathway			
Preparatory events	WISE program.	Additional events with the purpose of supporting prospective students from underrepresented backgrounds.	Faculty and current student participation; Graduate Admissions is ready to support.
MS Recruitment			
Increase applicant pool	We attend affinity organization national & regional conferences.	Increase participation in these events (host receptions, have faculty serve on panels).	Faculty and current student participation.

Re-evaluate **GRE as a requirement** for admission permanently.	GRE is currently optional for 2021.	GRE is race-biased and has little correlation with success as a grad student or a scientist. Removing GRE in admissions permanently removes a barrier to BIPOC & URM students.	Commission a panel or study with stakeholders to evaluate the need for GRE in our admissions process, using data from our school.
PhD pathway			
Preparation for Graduate School	Webinars, open to all not only specific to URM students.	Preparation webinar; Applying to grad school 101;. Target sophomores & juniors in Spring.	Volunteers (PhD students, Ambassadors, faculty) and staff organization.
Role models (Educational and diverse environment helps recruitment)	Faculty panels attend meetings with student groups. EGSC featured URM engineers on social media.	Enhance ambassadors program across departments; Showcase current students on the DEI website; Invite min one URM speaker to dept seminars per semester.	Partner with student groups- through EGSC and ESC (undergrad), affinity groups.
PhD recruitment			
Increase pool of applicants	REU programs Departmental recruitment programs	Establish relationships with undergrad students earlier in their career. ENGINE database for targeted outreach.	Add departmental recruitment activities and REU programs to the SEAS DEI website.
Pre Application Review program for doctoral applications	Columbia CS piloted this year with approval from the Dean's Office.	Pilot in all departments, involve student leaders/ambassadors; Integration with SEAS admissions cycle; Webinar panel of current students in November.	Department buy-in; Standardized training materials for reviewers; Student volunteers for live Q&A with current students.
Admissions fairs	Recruitment events at affinity conferences.	Increased faculty participation; Increase presence at admissions fairs by having multiple tables; Faculty at the booth, judges for posters/panels.	Distribute list of recruitment events to department DEI committees/chairs; Faculty involved at affinity conferences.

- **Medium Term Goals/Proposed Plans**

Undergraduate (BS)			
Topic	**Current Activities**	**Suggestions for enhanced activities**	**Necessary resources**
Columbia Engineering Experience (CE2) program	Currently we host 87 students. 85% applied to Columbia.	Expand the program. (Virtual F20 had	Additional funding for more students.

		200 students)[7].	
BS -> MS pathway			
Increase **interest in applying to grad school** among current BS students	Departments send out emails to listserv about events and talks.	More resources, events about career paths, classes/skills/REUs needed to be prepared for graduate programs.	Faculty and departments engagement with sophomore/junior students.
MS pathway			
Expand pathways from HBCUs	Have attended HBCUs graduate fairs occasionally.	Establishing meaningful reciprocal relationships.	Outreach from a member of leadership; Potential partnership agreement.
MS Recruitment			
On-campus employment to offset cost of studies	SEAS currently hires GA's from other CU institutions.	GA roles within SEAS offices specific to SEAS students (or open to SEAS students).	GA roles within SEAS offices.
PhD pathway			
Preparation for Graduate School	Bridge program.	Integrate with SEAS admissions cycle; Hosting more students, Establishing grad or postdoc peer mentoring system, more integration in SEAS (e.g. PDL, student activities).	More department buy-in.
Opportunities for **existing MS students** to transition into PhD	Professional Development Scholarships (e.g. EGSC) to attend conferences, sometimes to present.	Scholarships at a departmental level to MS students (**3x** a year); Encourage research and recognition from the department.	Department buy-in and funding; When accepted, assign mentor, funding for summer research.
PhD recruitment			
Increase pool of applicants	Engage, fly-in program	Expand program- host more students, more involvement in lab tours and meeting faculty and URM population.	Department buy-in and funding.

[7] Over **1000** students applied this year, **205** selected to participate virtually and almost **25%** just applied Early Decision.

- **Long Term Goals/Proposed Plans**

BS -> MS pathway			
Topic	**Current Activities**	**Suggestions for enhanced activities**	**Necessary resources**
Paying for a 5th year for a MS is cost prohibitive.	Many BS students have large financial aid packages.	Explore if financial aid packages can be extended to 5th year.	Funding, Dean's Office/COI review.
MS Recruitment			
Funding/scholarships for URM students to pursue MS degree	GEM scholars are fully funded. List of current financial aid here.	Expand funding options; provide need-based scholarships from the school; create a program similar to SPS, which offers full tuition, housing, industry mentor, and internship for students from HBCUs, funded by industry.	Funding and creation of a diversity fellowship for MS students.
PhD pathway			
Actively partner with HBCUs and MSIs	Collaboration with Tuskegee by Profs Boyce (ChemE), Vaughan (BME); Existing relationships with Howard, UC Davis.	Relationships at a faculty level; Short term sabbaticals for faculty;	Grants and travel expenses.

Best Practices and Resources

There are a number of internal programs within SEAS and Columbia that can be leveraged as we try to achieve the mission outlined by the committee. **These include the** Bridge to PhD program, directed by Dr. Kwame Osei-Sarfo, SEAS, the HK Maker Lab directed by Prof. Aaron Kyle, BME; Provost Diversity Fellowship Program for PhDs; Columbia Engineering Achievers in Graduate Education program (EngAGE); Hosting GEM fellows for MS in SEAS; Leadership Alliance Summer Program; Columbia SPS HBCU Fellowship; Pre-Application Review Program piloted by Columbia CS; Graduate Student Ambassadors in departments (e.g. ELEN, IEOR); EGSC Professional Development Scholarship for graduate students.

External resources include professional societies and organizations such as NYAS Afterschool tutoring, LinkEngineering.org, Harvard-New England Science Symposium, "Power Hours" at Gordon Conferences, and DEI Workshop/training[8] resources to create inclusive environments.. Our peers also run exemplary programs such as MIT program for URM postdocs, UCs give faculty grants for interns from HBCUs, Purdue hosts HBCU faculty every year, Virginia Tech hosts HBCU-MSI Research Summit and Princeton Grad Scholar Program.

Synergy with Other Priority Groups

[8] https://www.boundlessawareness.com/home

We have identified synergies with the other priority groups within the DEI Commission. An environment that is more diverse will help with recruitment.

Faculty	**PhD/postdoc to faculty bridge** similar to Bridge to PhD program; asking faculty applicants to address **plans to contribute to diversit**y at SEAS or in Engineering; additional faculty-Undergrad/Grad **mentoring.**
Environment and Climate	**Mentoring** (Undergrad/Grad); expand **affinity groups** and collaboration with them (Undergrad/Grad); **DEI training** and resources (Undergrad, Grad, Faculty, Staff). Expanded **tutoring** (Undergrad).
Integration	**Service recognition** for faculty that participate in pipeline and recruitment programs. **TA positions** to facilitate preparatory, pathway, role model, and recruitment events.

Summary of Recommendations

Priority suggestions for short term implementation. Resources needed: Faculty & current student participation; Funding.	
BS & BS -> MS	B1) **Support for tutoring** for sophomore/junior courses. **Seed grants** to enable departments to apply for funding to support tutoring services for two or three of their core undergraduate courses. B2) **Increase URM students conducting research** by increasing awareness of summer programs, and use of work study to conduct research. Create a flyer summarizing research programs at Columbia that faculty can advertise in class and circulate among their advisees and staff can circulate among engineering student groups. B3) Provide **role models to URM students** to aid in choosing an engineering career direction by hosting alumni panels to highlight paths that graduates have taken after SEAS.
MS	M1) Host **preparatory** Applying to Grad School 101 webinars by faculty/current students and admissions staff in Spring. Separate events for our a) current BS students targeting sophomores & juniors and b) outside students targeting juniors. M2) Increase **applicant pool** by having faculty and current students enhance presence at national/regional affinity organization conferences and admissions fairs. Admissions staff should share the SEAS Graduate Admissions recruitment calendar with department chairs and DEI committees. **Travel funds** provided for 2-3 faculty / students to attend top three conferences / admissions fairs to aid with recruitment. Faculty participation can include hosting workshops and giving presentations, in addition to helping with the recruitment table. M3) Increase **role models by expanding** ambassador programs in all departments, showcase current and past students on the DEI website, and include alumni within recruitment panels and networking events.
PhD	P1) Host **preparation for graduate school** (same program as M1). P2) Increase **applicant pool** (same program as M2). P3) Increase role models (same program as M3) P4) Expand **pre-Application review program.** Seed grants to enable departments to apply for funding for staff support and prepare training materials for reviewers.
Priority suggestions for medium and long term implementation. (takes time to pay off, start early)	
BS, BS -> MS	**Expand** the Columbia Engineering Experience (CE2) program. Extend financial aid packages **to 5th year.**

MS	M1) Continue expansion of **partnerships** with HBCUs. M2) Advertise and create more **on-campus employment** to offset the cost of studies. M3) Create **diversity fellowship** and need based scholarships for **URM students** pursuing MS degree. Fundraising through gifts and training grants are needed.
PhD	P1) Expand **Bridge** program and integrate into the doctoral admissions process. Fundraising through gifts and training grants are needed to increase the SEAS bridge fellows P2) Fundraise for **professional development scholarships** to motivate existing MS students to transition to PhD. P3) Fundraise to expand the **Engage** fly-in program to host a larger number of participants. Increase faculty participation in meetings, laboratory tours and meetings with participants. P4) Continue developing **relationships at a faculty level** and actively partner with HBCUs and MSI. This can be further developed with seed grants to establish new collaborative research projects.

Appendix 3b. Faculty Priority Group Full Report

Faculty Group members

Cliff Stein (Co-Chair) Professor of Industrial Engineering and Operations Research and of Computer Science
Renata Wentzcovitch (Co-Chair) Professor of Applied Physics and Applied Mathematics
Mindy Farabee Associate Director of Communications, SEAS
Hoe Ling Professor of Civil Engineering
Aimee Moses Graduate Student in Applied Mathematics, SEAS, EGSC
Alissa Park Lenfest Earth Institute Associate Professor of Climate Change, Earth & Environmental Engineering
Elizabeth Strauss Associate Director, Professional Development and Leadership, SEAS

Faculty Group Mission Statement

The faculty pipeline, recruiting, and mentoring breakout group focused on cultivating inclusivity in four primary areas: the faculty pipeline, active search practices, and on-going support for recruitment and retention efforts. We sought to identify current resources and recommend new initiatives and growth areas based on best practices at Columbia and peer institutions. Fostering a diverse and equitable faculty community is imperative to producing ground-breaking research, leading improvements in engineering and applied science teaching and learning, and modeling Engineering for Humanity mission.

Summary of Challenges in Priority Area

To thoroughly survey the current landscape of needs and resources for cultivating inclusivity across SEAS, all departmentments conducted workshops with parallel sessions focused on the four breakout groups' questions. Discussion outcomes were distilled and provided by each department as feedback to the breakout groups.

Based on these summaries, the faculty group recognized a deep need to address BIPOC and women's underrepresentation in the faculty body at Columbia Engineering with sustained, creative, and concerted efforts to attract more diverse applicants. In short, this effort must be two-pronged, with active hiring across all levels while retaining this faculty with strong internal support. Efforts should be made to ensure equity in candidate evaluation and to monitor progress towards equal representation. The latter requires access to continuously updated academic and general demographic data. We also need to address the pipeline issues and issues of process, including how search committees are formed and run and ensuring equity in candidate evaluation.

Summary of Community Input

After reviewing feedback from department workshops and speaking to various stakeholders, the group determined that greater attention must be paid to **mentoring URM students, encouraging applications from diverse faculty candidates, and supporting current faculty members' DEI work.**

Several key needs appeared repeatedly:

- Improve training and mentorship for URM faculty. This complex topic needs elaboration and also requires well trained mentors.
- Increase flexibility and creativity both in recruitment overall and specifically in types of positions hired for. Target of Opportunity positions and Cluster Hiring approaches can facilitate recruitment and retention. Short term Assistant Professorships and Research Scientist positions offer bridging positions and give candidates opportunities to further prove themselves.
- Increase focus on search committee composition and process. Diverse and well-trained committee members and participation of members external to home department are essential.

- Acknowledge that DEI candidates are highly sought after by other institutions and expand efforts to compete better. A faster search process might increase competitiveness.
- Reward DEI activities and ensure widespread participation extends far beyond URM faculty.
- Clearly communicate SEAS's commitment to DEI.

Opportunities and Action Plan

A successful plan will address activities ranging from expanding the pipeline to search and recruitment as well as mentoring and retention. The group identified four key areas to focus efforts to maximize impact. In each area the group identified short-, medium-, and long-term goals:

- **STEM Pipeline** – Departments should access a large pool of candidates to ensure successful recruitment. This involves establishment of new scientific networks including URMs, mentorship of URM home-grown talent, follow-up progress on URM careers are all part of successful recruitment strategies.
- **Active Search Practices** – Continuous open searches with well crafted ads attractive to URMs and Rising Star workshops are examples of uncommitted forms of active search.
- **Recruitment Practices** – The competition to attract URM candidates is fierce. Academic life-enhancing incentives are key to successful recruiting.
- **Retention Practices** – Working conditions and environment integration are key to retention.

Within each of these areas, the group identified several actionable short, medium, and long term goals.

Short-Term Goals (ready for immediate implementation)

- **Require faculty to report DEI service yearly (pipeline).** There are many activities that we identify as needed If we are to be serious about the importance of these activities, they should be part of the reporting process, along with other valued activities.
- **Require implicit bias training for all search committee members (active search).** Draw on resources from the Provost's office for training and revise the recommendations based on input from the SEAS DEI Commission.
- **Revise the SEAS standard job application (recruitment).** Review postings to avoid any language known to deter female or URM applicants. Require DEI statements from all candidates.
- **Augment Mentorship Opportunities (retention).** Review current departmental mentorship programs to ensure they are serving the needs of URM faculty. Other activities include reviving female faculty lunches and increasing URM network mentorship.

Medium-Term Goals (1 – 2 years)

- **Organize Rising Star Workshops (pipeline).** In cooperation with several peer institutions, we propose to organize a series of "Rising Star Workshops." In these workshops, we will invite URM students from other institutions to speak about their research. The set of topics covered by the workshops should roughly span the breadth of Columbia Engineering to create a network in which we are familiar with many URM candidates. The workshops can be done in conjunction with peer institutions to avoid duplication.
- **Review composition of search committees (active search).** Make sure search committees themselves are diverse while simultaneously ensuring that search committee service does not disproportionately fall on URM members. Include members from departments external to the current search, especially those who have served on successful DEI searches. Gather and consider input from students and postdocs.
- **Form partnerships with HBCUs and MSIs (recruitment).** Establish reciprocal partnerships with HBCUs and MSIs such as research collaborations that regularly bring students to Columbia and opportunities for people from Columbia

visit the other institutions (partly for the purpose of recruiting). We note that there is an existing collaboration between Chemical Engineering/ Biomedical Engineering and Tuskeegee.

- **Reward DEI service (retention).** DEI service must to taken into account explicitly in decisions involving promotion, tenure, and salary. Mechanisms will need to be developed to ensure that this change occurs and communicate that DEI service is being taken seriously and is being shared responsibility.

Long Term Goals (3 – 5 years)

- **Create additional Professional Development Opportunities (pipeline).** Increase flexiblity to create new types of positions like the transitional assistant professorships, which give DEI candidates several years to prepare and receiving more training before beginning a more traditional assistant professorship. Create more research scientist positions, consistent with the "fourth purpose" that President Bollinger has recently emphasized. Augment the support system to nurture talented URM students to prepare them for a career at Columbia or another institution.
- **Follow Rising Star workshop alums (recruitment).** Having created this network of Rising Star workshops, actively follow alums. Regularly invite participants for seminars to keep in touch with them and their research. When appropriate, actively recruit - a task hopefully made easier because of the previous efforts.
- **Conduct annual broad interdisciplinary searches (active search).** Interdisciplinary provide a greater chance to identify targets of opportunity and more flexibility to fill positions as opportunities arise.
- **Cluster Hiring (active search and retention).** Cluster hiring can be an effective means for URM recruiting. It has the additional benefit of create clusters that extend beyond SEAS in line with other goals. It also expands the pool of URM candidates by considering additional areas that may have better representation.

Best Practices and Resources

The committee identified several examples of best practices. We list them here with links where appropriate:

Internal Best Practices and Resources

- **Columbia Office of the Provost**: The Provost's office has a robust set of diversity resources, including programs to recruite outstanding URM candidates and an advisory council to help attract, advance, and retain diverse faculty.
- **Best Practices for Faculty Mentorship**: The Provost's office developed a guide to help academic leaders and faculty members who wish to use mentoring as a strategy to facilitate faculty success.
- **Cluster Hiring**: The University supports cluster hiring Cluster as an intentional approach to hiring that brings in multiple faculty engaged in related scholarship. A successful cluster hire can have a transformative effect, bringing in cohorts of scholars who serve as catalysts for groundbreaking scholarship and enhanced community building at the university.
- **Pathway to Professorship Workshop (including a program specifically for URM doctoral students)**: This two-day series of faculty-led panels and discussions focused on preparing students for their upcoming search for faculty positions.
- **Rising Star Workshops**: This new series of events brings diverse talent together for a day of presentations and workshops, with a first event, the joint effort "Engineering in Health" between biomedical engineering and Medicine held in December 2020.
- **Research Experiences for Undergraduates – REUs**: Columbia Engineering is expanding research experiences for diverse undergraduates, initially with two new partnerships between historically black colleges and universities and our Materials Research Center and Biomedical and Chemical Engineering departments.
    - Columbia University MRSEC REU

    - ChemE and BME-Tuskegee Partnership
- **DEI Training**: In partnership with University Life, the School offers various levels of DEI training, from introductory to in-depth.

External Best Practices and Resources

- Creative postdoc/faculty positions
    - **Cornell**: Presidential Postdoctoral Scholarship – 18 post-doctoral fellows in-residence for up to three years. Applicants must be no more than two years from PhD graduation date; generous scholarship including discretionary funding—no special mention to URMs.
    - **Brown**: Presidential Diversity Postdoctoral Scholarship – 3 post-doctoral fellows in-residence for up to two years; exclusively aimed at URMs.
    - **NYU**: Provost's Postdoctoral Fellowship Program – 8 post-doctoral fellows in-residence for up to two years; fellows teach up to one course per semester.
- Faculty exchanges and summer research positions
    - **Emory**: HBCU Fellowships - Short-term (10-14 days) travel awards to graduate students from HBCUs to collaborate with faculty members at Emory.
    - **University of California**: UC-HBCU Initiative – Several types of grants to UC-faculty to support a) 1-year "Summer Internships" for students from HBCUs, b) 3-year "Graduate Admission Pathways" - Summer research grants for URM undergraduates enrolled in the UC-system. The goal is to prepare them for graduate school; c) "Small Research Grants" to support Black graduate students in the UC system.
    - **Purdue**: Partnership with HBCU faculty – The Diversity Transformative Awards supports 2-3 day visits of HBCU faculty members to visit Purdue and get acquainted with research possibilities to develop collaborations and recommend Purdue to their undergraduate students applying to graduate programs.

Synergy with Other Priority Groups

The faculty group identified several areas of potential synergy with other priority groups. It hopes to engage along the following lines actively:

- **Student breakout group:** Pipeline (e.g., Rising Star Workshops, Additional Professional Development Opportunities)
- **Environment breakout group:** Retention (e.g., Mentorship, Rewards for Service)
- **Integration breakout group:** Active search (e.g., Bias Training, Committee Composition)

Summary of Recommendations

We conclude with a summary of our most important recommendations in each of the four areas:

Pipeline: Expand the URM pool for recruitment at all levels by developing interactions with HBCUs and MSIs, organizing rising star workshops, and nurturing homegrown talent.

Active search: Ensure search committee is inclusive and well trained in DEI and searches are interdisciplinary, broad, and run continuously; identify targets of opportunity possibly to be included in cluster hiring.

Recruitment: Carefully craft jobs ads and expand the reach of advertisement; request DEI statement by the applicant; follow our URM graduates' trajectory and those we come across through collaborations and rising star workshops.

Retention: Formalize mentorship, nurture URM networks, reward DEI service, create interdisciplinary clusters, including URM extending beyond SEAS.

Appendix 3c. Environment and Climate Priority Group Full Report

List of Group Members

- V. Faye McNeill, Ph.D., Professor, Chemical Engineering and Earth and Environmental Sciences
- Leora Brovman, Ed.D., Senior Associate Dean, Undergraduate and Graduate Student Affairs, Columbia SEAS
- Yannick Brookes, J.D., Assistant Dean, Office of Graduate Student Affairs, Columbia SEAS
- Diana Carranza, CU SEAS Chemical Engineering Undergraduate Class of 2021
- Cristen Scully Kromm, Dean of Undergraduate Student Life, Columbia University
- Neil McClure, Senior Associate Dean of Faculty Affairs and Chief Administrative Officer, Columbia SEAS
- Andrew Plaa, Ph.D., Dean of Advising, Columbia University

Summary of Challenges in Priority Area

Cultivating an inclusive environment and welcoming, supportive climate for diverse students, faculty, researchers and staff at SEAS, in addition to being consistent with our institutional values, is essential for the recruiting, retention and long-term success of members of the university community from underrepresented groups. Students, faculty, and staff from underrepresented groups benefit from culturally specific support, such as peer mentoring within affinity groups, but community-wide support can also lead to a more inclusive environment. Sustained support, not just during orientation period/early career stages, is needed for all cohorts during their time at Columbia. Support can take the form of funding (fellowships, support for activities, organizations and clubs, professional development support) or specific academic support, mentoring, career services, and other resources. The needs for support are layered and cohort-specific. Training is needed to educate community members on creating and maintaining a respectful environment on campus and in the lab and classroom. Pathways for communicating, reporting and holding the community accountable for DEI concerns and incidents need to exist and be transparent. Communication from leadership to the community surrounding DEI-related current events should also be intentional and coordinated.

Summary of Community Input

This priority group was lucky to have members with broad experience that spans the cohorts considered, but we also considered various sources of community input in our evaluation and recommendations. In this section we summarize input from (1) DEI workshops held in November-December in each SEAS department, facilitated by Dr. Kuheli Dutt (2) consultation with the CU Office of Postdoctoral Affairs (3) the Engineering Graduate Student Council survey (4) diversity data for staff provided by SEAS Human Resources.

- **Departmental workshops**

  The departmental workshops held in November-December 2020 included members of all cohorts considered. The complete workshop summaries are available as an appendix (APPENDIX A) Here we summarize the information specific to environment and climate that was gathered from the departmental workshops, organized by the questions posed by our priority group for discussion at the workshops:

  To what extent did DEI matters influence your decision to join Columbia/the Department?

  DEI matters positively influenced the choice of some cohort members to join Columbia in several ways:

  - The cultural and racial/ethnic diversity NYC and Upper Manhattan
  - The cultural diversity of the Columbia community and the background of international communities within Columbia
  - The availability of resources for diverse communities within Columbia
  - The involvement of faculty in DEI activities.

What sources of institutional or departmental support have been important to your journey at Columbia? What support do you wish you had but did not during your time at Columbia?

With respect to support while at Columbia, the common theme was that of availability of resources (financial aid) to support students (with particular reference to MS students), faculty and research initiatives with a minority focus; more initiative and intentionality on the department level to outreach to students and to create better access for underrepresented students to access and utilize resources like office hours; mentorship across all levels of cohorts represented on the campus.

- **Office of Postdoctoral Affairs**

Through the community survey it became clear that resources and services to support postdoctoral students do not fall under the purview of SEAS, except on an individual mentor basis. All postdoctoral researchers in SEAS, but especially those of diverse backgrounds, may be better served by support from within SEAS. This will also align with other commentary regarding the need for a critical mass of underrepresented students for purposes of student support, student and faculty recruitment and pipeline.

- **EGSC Survey**

The Engineering Graduate Student Council conducts a quality of life survey each year and uses the data collected to further improve the services and experiences of the graduate population. While the survey hasn't focused directly on diversity, equity and inclusion, this may be included in future years, and the content of past surveys can be useful in providing a broader perspective on the student experience.

- **HR diversity data for staff**

Exploring the diversity data of the greater metropolitan New York area it is apparent that at the staff level, Columbia Engineering is aligned with the demographics of the city. However, it was noted that this diversity is not consistent throughout the organizational structure, leading to a power imbalance with many of the higher level positions being filled by white males. It was suggested that there is a need for cross-function engagement among staff as well as cohort-specific programming for staff to connect with each other. It was also suggested that there is a need for more schoolwide opportunities for engagement and conversation. Importance of communication and transparency was also highlighted.

Opportunities, Best Practices and Resources

The priority group developed a comprehensive list of existing resources and suggested short-, mid-, and long-term goals for improving the DEI environment and climate at SEAS. The complete list, organized by cohort, is provided as an attachment (APPENDIX B). Major themes are outlined in the following sections.

In our detailed discussion and review of community input, several points emerged as common needs and best practices for an inclusive environment and climate, across cohorts.

- **Mentoring and social networks**

Mentoring programs and peer networks are invaluable tools for creating support within the community. Culturally specific networks and mentoring programs (usually arranged through student organizations) are routinely cited by undergraduate students as powerful sources of support and attractive features of Columbia student life. Besides peer group programs, students also value mentorship from faculty, so it is important to establish opportunities for more of this engagement. Mentoring programs and social groups for junior faculty within SEAS were also cited as excellent sources of support. Similar programs should be explored for other cohorts, especially as the diversity of

faculty, graduate student, and postdoctoral researcher populations increases. Given that staff diversity is already high, peer networking and cultural affinity groups should be established.

- **Sustained support**

Outstanding programs at Columbia, such as junior faculty mentoring in some SEAS departments and the Academic Success Program for undergraduates, were cited as valuable sources of support for community members from diverse groups. However, it was noted that most of these programs only cover the early years of the Columbia journey, and once a community member passes out of the target group (i.e. after a junior faculty member receives tenure, or after an undergraduate student shifts to mostly in-major classes) they may feel a lack of support. Solutions should be sought to provide support throughout the phases of the Columbia experience, e.g. mid-career mentoring and award programs for faculty or in-major peer mentorship and tutoring for undergraduates.

- **Rewarding and supporting academic and professional development and participation in DEI activities**

Graduate students, postdocs, and staff may be disincentivized to participate in DEI or professional development activities since they do not directly contribute to their primary job function. Although the involvement of community members from underrepresented groups in DEI activities (committee service, workshops, etc.) is crucial for their authenticity and effectiveness, care must be taken not to unfairly burden these groups with extra uncompensated labor. It is best practice to compensate or otherwise reward participation in DEI activities, particularly for students and staff. This practice avoids exploitation of underrepresented groups and creates a culture where such activities are supported by the supervisor. Similarly, support for professional development activities, including time off and potential funds for travel or registration, increases the feeling of support and inclusion on the part of the individual and signals to the supervisor that such activities should be encouraged.

- **DEI Training and education**

Most interpersonal DEI issues on campus arise from a lack of awareness of diverse cultures and sensitivities. DEI training and education can serve to raise awareness and create a more respectful environment for a diverse community. The training series offered by the Office of Multicultural Affairs for undergraduate student leaders was cited as being particularly excellent. Training and education should be an ongoing process, since (a) the university is a dynamic population with significant turnover of students, but many faculty and staff present long term (b) culture and society continue to evolve (c) some topics require significant reflection or repeated exposure to be completely absorbed (d) continuous efforts to discuss and find common ground on DEI matters signal to all community members that these topics are important.

- **Communication and accountability**

The issue of communication arises in the DEI environment and climate context in a few dimensions. Communication from the administration to the community when DEI-related current events arise should be timely and coordinated, so as not to leave members of affected groups feeling alienated. At the same time, for a healthy climate channels of communication for DEI issues must be open, and some assurance that they will be followed up upon must exist. Besides existing formal channels for reporting clear bias issues, e.g. to EOAA or to supervisors, HR, or faculty who are mandatory reporters, informal pathways for communicating less serious or more ‘grey-area’ issues may be valuable. Anonymous surveys/forms or liaisons outside the reporting structure such as student DEI ambassadors or peer advisors for staff may be valuable.

Synergy with other Priority Groups

An inclusive environment and supportive climate is a prerequisite for all other DEI efforts, so significant synergies exist between our recommendations and those of the other priority groups. An inclusive environment and climate is required to attract and retain diverse students and faculty candidates and ensure their success, leading to significant overlaps with the recommendations of the faculty and student recruiting (pipeline) groups. On the other hand, integrating DEI into research and education will create a more inclusive environment and climate.

Summary of Recommendations

The attached Appendix B provides detailed information regarding recommendations for the short, medium and long term. The following are some of the key recommendations to ensure a sustained and committed focus on diversity, equity and inclusion in SEAS:

Short-term recommendations

I. Mentorship for undergraduate students, peer-to-peer with upperclass students by department.

Ii. Undergraduate curriculum review to assess potential to add flexibility to courseloads to promote a less stress student climate and to promote greater prospects for academic success

Iii. Promote and enhance programming efforts across cohorts and class-years and develop further opportunities for the different cohorts to engage with each other throughout the school.

Iv. Enhanced academic advising and support for under-represented students through the Graduate Student Affairs office.

v. Create process for school-wide DEI communication on programmatic initiatives as well as issues of concern relating to community interactions

Mid- longer-term recommendations

I. Create formal mentorship program for graduate students with faculty and junior faculty with senior faculty

ii. Development of resources to support student recruitment, yield and retention, specifically at the graduate level. The school needs an aggressive program to develop resources for student financial aid at the Masters level.

iii. Review of financial aid model for undergraduate students and assessment of possibilities for financial aid to include summer sessions, thereby allowing students to spread their studies and encourage greater prospects for academic success.

iv. Undergraduate curriculum review to produce an updated curriculum which fosters student success and achievement.

v. Institutional support and resource allocation for faculty and staff engagement with and participation in DEI activities

Appendix 3d. Integration of DEI Into Research, Teaching, Outreach, and Innovation Subgroup Full Report

Priority Group Members

Cecily Castle - Leadership Giving Officer, Annual Giving
Augustin Chaintreau (Co-Chair) - Professor in CS and DEI CS coordination chair
Emily Ford (Co-Chair) - Director of Outreach & Special Projects
Pamela Graney - Postdoctoral Research Scientist in BME
Aaron Kyle (Co-Chair) - Sr. Lecturer in BME, Director - Hk Maker Lab
Barclay Morrison - Professor in BME and Vice Dean of Undergraduate Programs
Wendy Villa - Director of Finance and Administration, Electrical Engineering

Group Mission Statement

The DEI-Integration subgroup is particularly interested in establishing where and how DEI considerations are made part of all areas of the School's scholarship. Accordingly, the group set forth the mission to: **Intentionally introduce diversity, equity and inclusion issues into the Fu Foundation School of Engineering and Applied Science's (FFSEAS') education, research, innovation, and outreach activities.**

We place particular emphasis on the notion of **intentionality** in DEI integration. That is, we want to establish practices that will support explicit incorporation of diversity initiatives into the FFSEAS activities. The report presented herein discusses how DEI integration can be implemented.

Summary of Challenges in Priority Area

It is established, and appears to be widely accepted throughout FFSEAS, that DEI considerations are important and beneficial to the School's educational mission. The major challenge, informed by our internal conversations and the outcomes of SEAS-wide DEI workshops, is that there is a lack of knowledge of how to integrate these considerations into the various activities of the School and motivation to enact DEI initiatives. We perceive that our challenge is helping FFSEAS constituents overcome the 'how' deficit in order to successfully incorporate DEI. We propose that DEI integration can be achieved by:

- Creating explicit, tangible, and validated materials for **TRAINING** faculty, staff, and students on integration of DEI into practice.
- Conducting rigorous **ASSESSMENT AND EVALUATION** of DEI efforts to demonstrate their efficacy and promote continuous improvement.
- Creating **INCENTIVE AND ACCOUNTABILITY** structures to promote active engagement, beyond just awareness, with DEI by students, faculty, and staff.

By providing guidance in these three areas, we can guide the initiation and maintenance of DEI-centric activities within the school. Training will introduce DEI issues to FFSEAS constituents and help impart best practices for those who want to integrate DEI into their practice. Evaluation and assessment will show what activities are (or are not) effective and steer improvement. Incentive and accountability will create structures that motivate pursuit of DEI beyond altruistic endeavors that do not necessarily redound to career or academic progression.

Summary of Community Input

We sought community input via the DEI Worskhops that were conducted throughout FFSEAS. In order to elucidate departmental DEI integration issues, the questions displayed in Figure 1 were posed to the Departments:

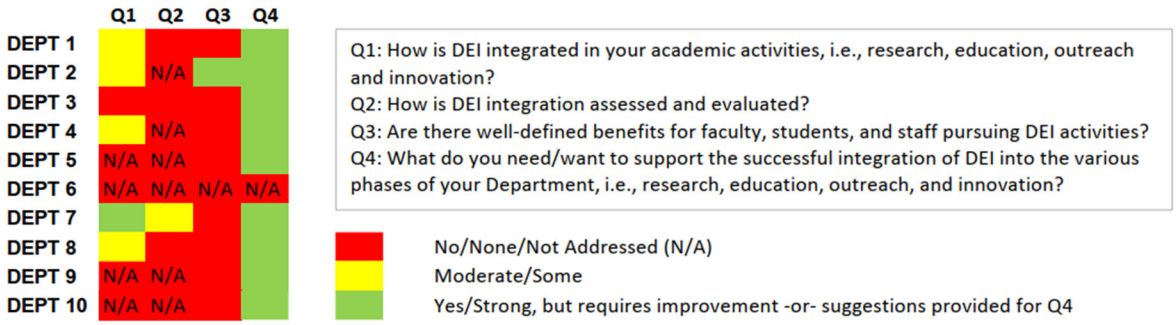


Figure 1: Summary of departmental workshop responses to DEI-Integration questions. These data are from the nine departments and the Dean's office.

Summary of Feedback

Each department's feedback with regards to DEI-Integration was examined and assigned a 'score' based on their confidence and response levels to the posed questions. Given the limited time assigned to the workshops, many of the integration questions were not addressed, hence the high frequency of N/A scores. Departments were scored having 'Moderate/Some' DEI content based on newly-established activities. Scores of 'Yes/Strong' were attributed to Departments with DEI activities that are established and ongoing. An overview of the departmental responses is provided in Figure 1. In general, it appears that integration, and the associated evaluation to demonstrate efficacy of practices, are not significantly considered or were not addressed during the workshops (Q1 and Q2). Much of the activity is informed by the directives and activities of the School, including the pursuit of diverse faculty and students. Department's DEI efforts are primarily via outreach; it is rarely a part of research, teaching, or innovation. Related to the lack of intentional integration of DEI, it appears that there is little incentive for faculty or staff to work on these efforts (Q3). No (0) departments identified explicit incentives for faculty or staff engaging in DEI. There are benefits for students, e.g., scholarships or teaching credits for graduate students, that are not universally available across departments. Despite the lack of specific efforts, there is (a) a clear appreciation for the importance of and (b) a desire to make DEI more substantial aspects of the Departments' activities (Q4.)

Opportunities and Action Plan

The action plan for DEI-Integration is presented via logic models. A logic model is a social science tool to plan, implement, and evaluate interventions to bring about desired changes in knowledge, attitudes, and behavior. A sample logic model is displayed in Figure 2. Reading from left to right, there is an if-then relationship between each of the fields. For example, if you use certain INPUTS then you can meet these NEEDS, if you leverage these inputs to meet these needs, then these OUTCOMES will be the result. We have outlined the short, medium, and long term action plans for 1) training 2) assessment and evaluation and 3) incentive in three separate logic models. For our logice models, the INPUTS refer to existing resources that can be leveraged to achieve desired OUTCOMES in DEI integration. The NEEDS refer to the action that we, as a committee, suggest should be created or enacted to attain the desired outcomes.

INPUTS *Existing Programs, Activities, Offices, Initiatives to leverage*	**NEEDs** *Activities/Resources/Participation to undertake leveraging existing resources to meet needs of various stakeholders*	**OUTCOMES & IMPACT**
	Short Term (within 1 Year)	
- Multicultural Affairs Office - Postdoctoral Affairs Office - Research Compliance & Training - Academic Diversity & Inclusion Office - CU Center for Teaching & Learning - Center for Integration of Research, Teaching, & Learning (CIRTL) - Center for the Improvement of Mentored Experiences in Research (CIMER) - CU HR: orientation, ongoing PD, staff evaluation framework - Individual Development Plans (IDP)	Audit content of existing resources and opportunities for potential DEI topics Establish courses discussing DEI and ethics in STEM Establish social justice course/module for STEM Introduce students to IDP development and personality traits/different learning styles Develop refresher workshop/orientation on DEI-specific to declared majors	Identify opportunities to push content into existing trainings DEI training topics are developed, implemented, and require for all levels along with existing trainings
	Medium (within 5 Years)	
- CU Fellows Programs: Columbia Technology Ventures (CTV), ASPIRE, DSI Scholars - Summer @SEAS, Columbia-Amazon SURE program - CU Workshops: Pathway to Professorship, NSF GRFP, Under1Roof - CS/AI Ethics Review Committee - NIH's Broadening Experiences in Scientific Training (BEST)	Offer credit for participation in DEI programs Increase visibility of current DEI activities Provide mentorship training at all levels Develop workshop on DEI integration in research and innovation Provide outreach training for those interacting with diverse populations Develop mini-series of courses introducing students to career paths accessible with STEM degrees Establish professional development programs for staff that create infrastructure for promotional pathways	Credit-bearing coursework and professional development related to DEI & ethics; inter- disciplinary course of study will legitimize DEI work in an academic context Research proposals and courses will have review committee for DEI and ethics lens and implications
	Long (within 10 Years)	
- CU Collaborative for Youth & Family Programs & SEAS Outreach - Committee on Instruction - Course evaluation framework	Require teaching training with practical experience through outreach Partner with surrounding organizations to offer experiential opportunities of careers beyond academia Offer training for incorporation of DEI into course development and assessment Require faculty completion of annual refresher training for developing learner-centered approaches in teaching and innovation Host annual department retreats to reflect on DEI practices, assess impacts, and identify areas for continued improvement	Senior leadership will create a position to oversee and facilitate DEI initiatives at SEAS and ensure DEI commitment is fulfilled in practice

INPUTS *Existing Programs, Activities, Offices, Initiatives to leverage*	**NEEDs** *Activities/Resources/Participation to undertake, leveraging existing resources to meet needs of various stakeholders*	**OUTCOMES & IMPACT**
	Short Term (within 1 Year)	
NSF-CISE Broadening Participation Network (BPN), CTL Best practice to address DEI in the classroom, CTL GRA offerings: https://ctl.columbia.edu/graduate-instructors/ Hk Maker Lab and SEAS outreach subject to rigorous assessment and evaluation as part of research efforts. Results disseminated in publication SEAS E-ship programs, CBS Harlem Small Business.	Creation of a SEAS leadership position with the sufficient authority and resource to orchestrate data collection Departments and SEAS create broadening participation plans (BPPs) Collect data about and from various groups in SEAS, (including demographics) and their potential for DEI effort Integrate DEI-themed evaluation in annual faculty/staff evaluation Integrate DEI question as part of course evaluations	SEAS DEI activities assessed and evaluated to inform best practices SEAS DEI data is transparent and available to internal stakeholders Data is collected from communities without reproducing the asymmetric powers of surveillance ("use community as guinea pig" U Penn Netter example)
	Medium (within 5 Years)	
	Develop tools to disseminate findings/best practices to streamline development and implementation of novel outreach activities. Collect diversity statements from graduating students/postdocs entering academic market and use them to evaluate how lab/department offer such training opportunities Integrating school wide survey on attitudes and sense of belonging in STEM Assess staff development/growth/promotion Collaborate (with Psychology, Public Health, Social Work) to develop surveys. Introduce inclusion survey on all research projects - as part of funding mechanism	Establish an infrastructure service of data access to monitor the effect of DEI activities in representation/belonging Improve staff retention via promotion professional development path
	Long (within 10 Years)	
	Create internal infrastructure for data collection assessment and evaluation of all our stakeholders Publish and revise specific measurable goals for various units (school/dept/lab) that guide effort	Substantive, data-driven approaches to DEI-Integration

INPUTS *Existing Programs, Activities, Offices, Initiatives to leverage*	**NEEDs** *Activities/Resources/Participation to undertake leveraging existing resources to meet needs of various stakeholders*	**OUTCOMES & IMPACT**
	Short Term (within 1 Year)	
Annual Review (Faculty, Staff, Students(?)) DBME Awards TA Credit SEAS communications publications Endowed scholarships for URM students	Include DEI in annual review/promotion portfolios Consider recognition such as teaching relief / funding for students who conduct DEI	DEI activities recognized and positively impact annual review DEI work considered an integral part of students' (graduate & undergraduate training and education More community-facing work study positions that result in credentials for students Positively market SEAS on DEI activities to demonstrate ongoing commitment and promote broader participation
	Medium (within 5 Years)	
SEAS (Faculty) Awards Intramural Funding for DEI (SEED Grant) Ad hoc salary support for faculty pursuing summer DEI activities Education innovation grants Financial support from Provost for URM faculty recruitment Department level sponsorship for DEI activities	Distinct awards for research, education, outreach, innovation Staff-focused opportunities (fellowships, internships, research training, mentoring, awards) Consider support for faculty engaging in DEI (e.g. partial teaching relief) Codify considerations of DEI in tenure/promotion Incorporation of DEI considerations into all aspects of faculty career from job posting - promotion/review Guidelines and support from Dean's office to encourage such activities (informed by assessment and evaluation General fund to provide grant and current use funding to DEI activities	Recognition for DEI part of SEAS ecosystem, could even become motivator for activities. Greater level of diverse staff inclusion via support for professional advancement Overcoming barriers to Faculty conducting DEI Work (Tenure/Promotion)
	Long (within 10 Years)	
	General fund to provide grant and current use funding to DEI activities Dedicated application process and funds for both planning and bridge funds for DEI efforts	Sustained financial support of DEI activities for faculty, staff, students, and programs (endowed and current use) Culture of DEI appreciation, not obligatory or responsive, but an intrinsic part of SEAS

Best Practices and Resources

Here is an example to illustrate concretely how DEI integration would change practice, expanding current evaluation and offering additional support. Today, within a single class, materials could be expanded or edited to ensure that the works cited and the scholars included by name/pictures reflect the diversity currently present - or desired - in the field. For instance, an introductory class on social networks that mostly cite 1970-90s literature would not convey to students how today's most prominent researchers in this area count multiple female and underrepresented minority researchers. Today, without incentivized integration the burden of updating materials to reflect contemporary diversity rests entirely on the instructor. No conclusion will be reached (beyond student feedback) on the update's efficacy. In contrast, in an integrated approach, FFSEAS may (1) support the instructor in assessing the efficacy of assessment efforts. (2) FFSEAS may help organize that classroom materials are updated with others joining the effort. (3) Assuming that regular course evaluation includes a dedicated question related to DEI, the instructor might explicitly receive credit, contributing to promotion. (4) When training is integrated within a regular faculty/staff lunch, the results of this type of initiative are easier to share as part of a regular seminar. If successfully validated, this effort becomes an example for others who are working on improving their DEI performance.

Internal (FFSEAS, Columbia)

Fortunately there are many resources that exist at Columbia that we can leverage to develop a more robust DEI infrastructure, as listed as inputs in the logic models. With these existing resources in place, our focus is on reviewing existing processes (recruiting, orientation, evaluation, promotion, etc.) where there are opportunities to incorporate DEI content. With this also comes a chance to introduce feedback and accountability on DEI practices. One notable best practice is a program that the UDAR office has in place to mentor and develop their staff called My Columbia Career. Much of FFSEAS' diversity lies in its staff and it would greatly benefit from such an initiative.

External (NYC and beyond)

The NSF integrates the evaluation of merit for funding by including a "broader impact" or "broadening participation" criterion, but that remains limited to the level of one NSF project. The CISE directorate recently encouraged a more comprehensive approach, where a department that intends to receive medium and large projects funding is encouraged to publish a Broadening Participation Plan (BPP), which is reviewed and made public (bpcnet.org/). Similar efforts are underway in associations like ARIS (www.researchinsociety.org/). The CIRTL Network (https://www.cirtl.net/), to which Columbia does belong, is also a valuable resource both for modeling best practices and training others to adopt them.

Synergy with Other Priority Groups

DEI-Integration inherently overlaps with goals and activities identified by other priority groups. Evaluation of DEI activities is particularly critical for **students**, because the retention of diverse talents is a multi-stage difficult problem to address. For **faculty** recruiting, it is not uncommon for a promising diverse faculty candidate to receive an offer from Columbia and go elsewhere. Integrating DEI activities in a departmental plan that is publicly accessible at least helps during recruiting season to reassure a diverse candidate that the environment will recognize and support efforts that may be meaningful to minority candidates. Integration can significantly improve **climate and environment** by providing staff better recognition for their contribution to the DEI goals of the school. Because most of the integration effort would require collaborations between faculty and staff for joint training or evaluation, the expertise and potential of staff to help in front facing issues will be shared with faculty. For instance, we highly recommend that training such as DEI practice lunch are organized jointly to hear from multiple perspectives on campus, and that grant and service awards are redesigned to recognize staff's unique contribution. Integration will also open avenues for staff promotion.

Summary of Recommendations

There is a clear desire, perhaps even a mandate, within FFSEAS to intentionally integrate DEI into our educational mission and practices. This report proposes specific actions that will enrich our School through DEI. We propose that the following actions should be undertaken (short term activities are italicized, the remaining activities are long term):

- **TRAINING:** *Require annual training and customize it to audience and field*; *Offer opportunities for practical training through courses, internships, etc.; Create a seminar series, similar to the Teaching Innovation Lunch on how to incorporate DEI.*
- **ASSESSMENT AND EVALUATION:** *Audit content of existing resources and opportunities for potential DEI topics*; *Collect and share department and school level demographic information*, Create (Lab, Department, and School) Broader Participation Plans;
- **INCENTIVE:** *Recognize and emphasize DEI in annual review for faculty & staff; Compensation for students conducting DEI;* Funding/Salary/Teaching Relief for faculty DEI efforts and include DEI in considerations for promotion and tenure.

Through these overarching actions and the specific activities proposed herein, we assert that DEI can be intentionally, successfully integrated into the infrastructure of FFSEAS.