Dear Professor Wang, Head of the Department of Mechanical Engineering; MechE Departmental Committee on Graduate Studies; MechE Admissions Committee; and MechE Faculty,

We write to you on this important date because it pains us to see our department fail at the most fundamental belief of our institution: Mens et Manus. For decades, our department and MIT as a whole have forgotten about 'and hand' when it comes to addressing systemic racism at this institution. There is no shortage of papers, working groups, task forces, resolutions or reports that our institution has published to bring light to the fundamental inequalities that exist within MIT, yet, within our own department, the lack of action is glaringly evident:

1. Underrepresented minority (URM) enrollment is currently at 8%, having fallen from its “peak” of 9% in 2013.
2. Of the approximately 500 graduate students currently in Mechanical Engineering, only six are Black. This is down from the low number of 11 in 2011.
3. Only 4 out of 127 faculty in the department are Black.

The problems that the Mechanical Engineering Department has with diversity, equity and inclusion (DEI) by no means end with representation. In order to properly prepare students for their careers and the realities of life after MIT, this department must begin to place the same emphasis and educational priority on racial and social inequality as it does other essential topics like engineering fundamentals, ethics, and safety. Furthermore, in its tepid responses to the consistently low acceptance, retention, and graduation rates of underrepresented minorities, the Institute effectively denies the world countless scientific discoveries and engineering breakthroughs. This consequence is detrimental to MIT’s founding purpose: “for advancement and development of science and its application to industry, arts, agriculture, and commerce.” Without concrete accountability criteria and structures in place, previous action plans have had a minimal impact on these issues, and as a result, our department continues to participate in academic and social systems that are persistently and pervasively unfair to Black, Indigenous, and People of Color (BIPOC). As a program that strives to be a world leader in STEM, our department must actively fight for racial and social equality within our walls to set a worthy example for institutions and individuals that look to MIT as a touchstone of progress and innovation. We must lead by enacting and fully embodying our core principles.

This open letter is a call for action and accountability to everyone in our department. At this time of nation-wide reform following the horrifying murders of George Floyd, Breonna Taylor, Ahmaud Arbery, Tony McDade, Manuel Ellis, and many others, our department has responded by creating a task force and committing to hire a Community and Equity Officer (CEO). While these are steps in the right direction, we must ensure these new appointments are empowered to enact immediately feasible, long-overdue changes, and to sustain the effort of constructing an equitable and inclusive environment. We cannot allow this opportunity for change to be

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1 MechE Diversity Statement
2 LSC Graduate Student Data
3 Graduate Minority Enrollment
relegated to another 5-year plan. Decades of inaction from our department and MIT as a whole must be addressed with **urgent and transparent reform** in order to convert the national momentum for racial equality into lasting, institutional change for the MIT community.

The actions within this letter are specific to the Mechanical Engineering Department. These actions are proposed by the MIT Graduate Association of Mechanical Engineers (GAME) DEI working group. The actions address the implementation of ideas that Black students at MIT have championed for years,\(^4,5\) and that the Institute itself has proposed in many public declarations.\(^6,7,8,9\) The **actions** are organized to address specific deficiencies within the department: (1) Recruiting and Admissions, (2) Support and Education for the MIT community, in particular BIPOC members, (3) Training on Racial and Implicit Bias, (4) Department-wide Accountability on DEI Issues, and (5) Outreach Programs. Finally, we specify ways to (6) Empower the incoming CEO and the DEI Task Force.

A summary of the actions is presented on the following page. Expanded descriptions and justifications for each point are provided in the remainder of the letter. Members of the MIT community can express their support by adding their signatures to this open letter at [https://game.mit.edu/dei-working-group](https://game.mit.edu/dei-working-group). In addition, we unequivocally support the BGSA/BSU 2020 petition and request that the department publicly show its support by signing the petition.\(^10\)

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\(^4\) [Black Graduate Student Association - Recommendations](https://game.mit.edu/dei-working-group)
\(^5\) [Black Graduate Student Association - Follow up on recommendations](https://game.mit.edu/dei-working-group)
\(^6\) [A Resolution Concerning URM Faculty and Graduate Student Recruitment and Retention](https://game.mit.edu/dei-working-group)
\(^7\) [The Report on the Initiative for Faculty Race and Diversity](https://game.mit.edu/dei-working-group)
\(^8\) [Diversity Summit Report](https://game.mit.edu/dei-working-group)
\(^9\) [A Report on the Status of Women Faculty in the Schools of Science and Engineering at MIT](https://game.mit.edu/dei-working-group)
\(^10\) [BGSA/BSU 2020 Petition](https://game.mit.edu/dei-working-group)
Summary of Actions

1. **To increase the representation of URM students and faculty** in mechanical engineering, the department must:
   - Conduct an external review of the current admissions and hiring processes.
   - Remove the GRE as a graduate admissions requirement.
   - Actively recruit URM applicants, especially graduate student and faculty applicants, and evaluate program effectiveness on a yearly basis.
   - Publically announce a 10-year plan to reach equal-to-population representation for URM students and faculty by 2030.
   - Issue a 10-year challenge to comparable programs nation-wide and other MIT departments to address URM representation.

2. **To address DEI issues during a student's time at MIT**, the department must:
   - Increase the visibility of URM scholars in academia and professionals in STEM.
   - Fund research into the systemic bias that negatively affects URM students at MIT.
   - Establish a confidential method for reporting and addressing race-based discrimination.
   - Offer an orientation program for incoming URM students.
   - Expand programs that promote the success and well-being of URM students.

3. **To enhance awareness in diversity and implicit bias**, the department must:
   - Require all incoming students to complete instructor-led diversity training before beginning their studies.
   - Require all faculty, admissions officers, staff, postdocs, and current students in the department to complete annual in-person or video-conference implicit bias training.

4. **To ensure accountability for performance related to the matriculation and graduation of URM students**, the department must:
   - Publicly announce its financial commitment to DEI efforts.
   - Require exit interviews for any graduate student leaving a lab group.
   - Assign members to the Visiting Committee responsible for providing consistent attention to the DEI problems in our department and the work being done to address them.
   - Present semi-annual progress reports to the community in public forums.

5. **To support URM students entering STEM before they enter higher education**, the department must:
   - Establish a relationship with the MIT Office of Engineering Outreach Programs (OEOP).
   - Evaluate how it can support existing programs like those offered by the MIT OEOP.
   - Develop an infrastructure to support students, especially graduate students, who want to teach or provide mentorship at the K-12 level.

6. **To empower the Community Equity Officer and DEI Task Force**, the department must:
   - Enact suggestions of the CEO and Task Force for DEI initiatives.
   - Hold faculty and staff accountable for their demographic-specific hiring, attrition, and graduation rates.
   - Incorporate DEI criteria in hiring, promotion, and admissions practices.
   - Establish regular DEI progress reports to the department and any Visiting Committee.
   - Ensure that the task force meets for the first time no later than August 1st, 2020.
1. Recruiting and Admissions

Immediate Actions

a. **Conduct an external review of the admissions and hiring processes in the Mechanical Engineering department:** With a special focus on evaluating current methods used by the department that are either helping or hindering underrepresented minority (URM) representation, where MIT defines URM as people of African/African American, Indigenous/Alaskan Native, Latinx, and Native Pacific Islander descent. Once this process has been completed, there should be at least one faculty member on the admissions and hiring committees each year who is specifically assigned to ensure that diversity, equity, and inclusion (DEI) values are being upheld as an important component of the admissions and hiring processes. This can be similar to the role of the equity advisor on faculty searches in the University of California system.11

b. **Remove the GRE as a requirement for admission:** GRE scores are biased against minority applicants. The exam itself costs $207, and it costs $27 to send scores to each institution. Preparation costs between $700 and $2500 (Kaplan). In addition to being inaccessible for low-income applicants, it embodies institutional racism because its testing is concentrated on more traditional experiences in the system.12 Additionally, there is documented disparity in test scores on the basis of race,13,14,15 Using the GRE as a requirement and a basis for admission is therefore exclusive of racial minorities and low-income students. Additionally, the test is not found to be a strong predictor of PhD completion,16,17,18 so using it as a filtering tool leaves out underrepresented students at no obvious benefit to the university.

Near-Term Actions

a. **Develop and implement programs to encourage URM candidates to apply to undergraduate and graduate school and faculty and staff positions in Mechanical Engineering:** Every year, the efficacy of these programs to broaden the applicant pool should be evaluated. Possible programs include:

   i. Provide funding for current mechanical engineering URM students and faculty to aid in recruiting and mentoring of incoming URM candidates.

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11 University of California: Developing campus Equity Advisor (EA) program
12 Why We Should Use Noncognitive Variables With Graduate and Professional Students, UMD
13 Using GRE Scores of Test Takers from Underrepresented Groups (For Institutions)
15 GRE Worldwide Test Taker Report - July 2013-June 2018
16 Miller, C. W., et al., 2019, “Typical physics Ph.D. admissions criteria limit access...,” Science Advances, **Vol. 5 No.1**. DOI: 10.1126/sciadv.aat7550
17 Durbin, D. G., 2017, “How should we be selecting our graduate students?,” Mol Biol Cell, **Vol. 25 No. 4**. DOI:10.1091/mbc.e13-11-0646
18 Hall, J. D., et al., 2017, “Predictors of Student Productivity in Biomedical Graduate School Applications,” PLOSOne. DOI: 10.1371/journal.pone.0169121
ii. Send admissions officers to HBCUs and meetings of NSBE and SHPE in universities and colleges across the country to specifically encourage applications to graduate school.

iii. Organize an annual visit weekend, inviting 200-300 URM undergraduate sophomores and juniors by the 2021-22 school year. This event will give students an opportunity to speak to faculty, be exposed to labs, meet current students, and access resources on applying.

iv. Create specialized programs for URM students that provide a dedicated community with a program leader, guaranteed graduate housing, and other necessary resources, similar to honors programs in undergraduate degree programs. This could be achieved by expanding existing programs like MSRP and UCEM, which also foster community building through pod cohorts.¹⁹

v. Start a bridge program with one or more HBCUs, in similar practice to the Fisk-Vanderbilt Bridge Program, which in less than 10 years became the top producer of black students with Master’s degrees in physics and top producer of minority scholars with PhDs in astronomy, physics, and materials science for Fisk University and Vanderbilt, respectively.²⁰

vi. Actively build formal and informal interinstitutional partnerships, specifically with URM faculty and minority-serving institutions. Faculty at minority-serving institutions can provide references for a diverse population of potential graduate students and MIT faculty can in turn provide resources to these students regarding graduate studies and research at MIT. These partnerships may also help to preemptively identify gaps in student preparation so the curriculum can be adjusted appropriately to prepare students effectively for graduate school curricula.²¹

b. Publish and implement a 10-year plan to increase the number of underrepresented minority graduate students and faculty, in particular BIPOCs, with the stated goal of equal-to-population representation by 2030: This should specifically address plans to ensure critical mass of new URM students each year to prevent the feeling of isolation among URM students.²²

c. Issue a 10-year challenge to comparable programs nation-wide and other departments within MIT to address URM representation.

2. Support and Education for the MIT community, in particular BIPOC members

a. Increase visibility of BIPOC and URM professionals in STEM and academia through talks, seminars, symposiums, forums, and classes. Current efforts include BGSA’s

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¹⁹ MSRP Pod Leaders


²² Ibid.
monthly Community Lunch series with MIT professors and Students Advocating for Increased Diversity (SAID) in STEM seminar series. **Because a department-hosted initiative does not exist,** we demand that the department:

i. **Fund more departmental talks about inequalities in Mechanical Engineering and STEM.** These talks should be organized by the department for added credibility; recurring to maintain commitment to the cause; and mainstream, rather than advertised as a “special diversity seminar”. These talks should also provide networking opportunities for attendees and include a budget for refreshments.23

ii. **Require that the department commit to hosting more BIPOC and URM speakers for department-sponsored talks, seminars, and symposiums.** The department must commit to hosting greater than the maximum percentage of either URM students or faculty in the department; a declaration that the department is committed to dismantling a tradition of hosting presenters from a narrow spectrum of backgrounds.24

iii. Continue to hold **moderated departmental DEI town halls** and select moderators with bias training and conflict mediation experience, such as an MIT Ombudsperson.

iv. **Enhance the Mechanical Engineering curriculum with topics on racial disparities in STEM,** emphasizing the seven research focus areas in the department. The department has an obligation to educate all its students on the social and historical contexts of their work and how they can alleviate racial disparities in their professional careers. These curriculum adjustments should be made in the form of new courses and additions to existing courses, particularly required courses at the undergraduate and graduate levels. Faculty should incorporate these topics in the same way they incorporate the topics of engineering ethics and safety into their courses.

b. **Fund research/data collection efforts into hidden inequalities we may be creating and perpetuating within the department:**

i. **Investigate the probable existence of anti-Black bias in doctoral qualifying exams, and take immediate action to remedy this obstacle to success if it is found to exist.** Research on doctoral qualifying exams in STEM has indicated the presence of anti-Black bias, both in exam outcomes25 and its disproportionately obstructive effects on Black students.26,27

ii. **Identify and address hidden curricula in courses,** which include tacit course requirements, assessment methods, and class structures with racist and

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24 What It Will Take to Improve Diversity at Conferences


marginalizing outcomes. The solution should include mandatory crash courses for instructors spearheaded by teaching fellows in collaboration with the MIT Teaching + Learning Lab aimed at recognizing elements of the hidden curricula and addressing them through well-designed instructor-student feedback loops and consistent “course correcting.”

c. Develop a formalized, transparent process for reporting and addressing instances of race-based discrimination in the department. Currently, this reporting is handled through HR or IDHR, and the individual who files the complaint is not informed of the outcome. The department must increase the transparency of this process to ensure community members see their complaints appropriately addressed, whether that is through the provision of additional support and resources, conflict mediation, or punitive action. Yale University uses secure case number tracking for individuals and issues regular, anonymized reports to the entire community on complaints filed with their Title IX Office. Implementing such measures for reporting incidents of discrimination will increase the support of underrepresented groups within the Mechanical Engineering community and enable the department to refine its approaches to combat racism and discrimination.

d. Design and implement new orientation activities to support incoming URM graduate students in Mechanical Engineering
   i. Work with offices like OGE, OMP, and SPXCE to create targeted sessions addressing challenges faced by students belonging to racial or ethnic minorities.
   ii. Provide clear information on accessing resources available within the department as well as in the broader MIT community for dealing these issues.
   iii. Facilitate community building amongst students and faculty sharing identities that can serve as a support system after orientation.
   iv. Design and implement these activities by the 2020-21 academic year orientation.

e. Strengthen and expand tailored resources for promoting the well-being and success of URM students
   i. Expand the scope and availability of mental health resources to ensure that services assisting with race-based traumatic stress are permanent and free of cost to URM students. In response to recent events, MIT Medical has started to provide some discussion groups and workshops on dealing with issues like racial microaggressions, violence, and inequities affecting communities of color. The department should collaborate with MIT Mental Health to offer group counseling

30 Section 9.8 from MIT P&P
31 Yale Office of the Provost Title IX Reports
32 Patient Services Student Mental Health & Counseling
specifically for Mechanical Engineering students to overcome issues that arise in academic, research, and social settings.

ii. Work with offices such as OGE, CAPD, UCEM, MechE Alliance, and the Industry Liaison Program to create programming that helps URM students overcome professional and academic challenges that are unique to these groups. URM students’ prospects in both industry and academic job searches are often negatively affected due to systemic racism and other known biases.

3. Training on Racial and Implicit Bias
To implement the BGSA recommendation to, “require diversity training for incoming graduate students [and] require implicit bias training for research laboratory personnel – including faculty, staff, and students,” the department must:

a. Require all incoming students to complete in-person or video-conference diversity training as a condition of enrollment. Currently, MIT offers optional, online diversity training which is not enough to ensure that all students are prepared to study and work in a diverse and multicultural environment and know the expectations of MIT.

b. Require all lab personnel (faculty, staff, postdocs, and students) and admissions committee members complete annual in-person or video-conference implicit bias training. In the Mechanical Engineering Department, the success of students in research is highly dependent upon the lab environment in which they work. As a result, URM graduate students are disproportionately affected by implicit biases held by other members of their lab, in particular, PIs and other senior lab personnel. This is acutely important in the context of graduate admissions as well. Currently, optional implicit bias training is offered to labs, but this is insufficient, as those who may hold implicit biases are often unaware of their biases or believe they are immune from holding biases. All faculty involved in graduate admissions and hiring must complete annual in-person bias training to ensure fairness in admissions cycles and faculty searches. Everyone has implicit associations, and making MIT lab personnel and admissions committees aware of their own biases cannot be predicated on the assumption that they will independently seek out training.

34 Repeated exposure to bias prevention training is significantly more successful in addressing the issue than isolated, single instance trainings: Devine, P. G., et al., 2012, “Long-term reduction in implicit…,” Journal of Experimental Social Psychology, Vol. 48 No. 6, pp.1267-1278. DOI: 10.1016/j.jesp.2012.06.003
Training resources exist within the Institute already, and MIT is actively investing in the Institute Community and Equity Office to continue the development and efficacy analysis of these trainings. We ask that MechE consider bias training as essential as Health and Safety training by requiring that this training, considered optional at the Institute level, be mandatory in our department.

Because in-person training may not be feasible during the pandemic, the department should immediately begin to offer interactive training for incoming students and current lab personnel via Zoom or other similar technology. The department can adopt additional existing resources for such training. Piloting training options to targeted groups within the department will ensure that whichever training program MechE adopts fits the department's needs and has community buy-in.

4. Department-wide Accountability on DEI Issues

To implement the BGSA recommendation to, “introduce greater accountability for departmental performance related to the matriculation and graduation of URM graduate students,” in the Mechanical Engineering Department at MIT, we demand an accountability mechanism with four components:

a. Publicly announce exactly how much money the Mechanical Engineering Department plans to spend on DEI initiatives annually. MIT publicly pledged $1.1B to the College of Computing and $400M to MIT.nano. Deconstructing systemic racism also requires explicit resource allocation.

b. Require exit interviews for any graduate student leaving a lab group, including graduating Master’s students, graduating PhD students, students switching advisors, and students who drop out. Currently, exit interviews are only required for graduating PhD students. These exit interviews will enable the department to collect and analyze lab-specific, demographic data on timeline to graduate and retention rate. The department should use the data to identify patterns, assess instances of systemic bias and discrimination, and address these disparities with case-specific solutions. These interviews, including any identifying information, must be kept private to ensure honest responses. If the department wishes to publish aggregate data to the community, an external entity, such as the MIT Ombuds Office or Institute Research, should be consulted on how to properly anonymize the data.

c. Incorporate experts with experience in changing culture around discrimination into the department Visiting Committee to provide consistent attention to the problems

36 “Student: Diversity, Equity & Inclusion” Atlas Training Course BSK34025w.
37 “Breaking the Bias Habit” Atlas Learning Bundle BSK34076r.
38 “Contributing to an Inclusive Community” Atlas Learning Bundle CDT23075r.
39 John Dozier named Institute Community and Equity Officer
40 Inclusion Design Group | Connecting professional networks, corporations, and sites of learning with experts in diversity and inclusion services; Unconscious Bias, Conscious Inclusion, Curiosity Over Judgment - Breaking the Bias - Unconscious Bias, Conscious Inclusion Training and Strategy
existing in our department and the work being done to address them. Require department administrators to report to the department and Visiting Committee on demographic-specific acceptance, graduation, and retention rates, including outcomes on qualifying exams.

d. **Make these reports public in semi-annual departmental town halls.**

5. Outreach Programs

To increase the prevalence of underrepresented groups in MechE, the department must work to support their entry into the STEM pipeline at all levels, including K-12 education. MIT presently has a portfolio of education outreach programs, including several offered by the MIT Office of Engineering Outreach Programs (OEOP) aimed at underrepresented middle and high school students with limited access to resources (i.e. MITES, MOSTEC, and SEED). To support such programs as these, the department must:

a. **Establish an official and ongoing relationship with the OEOP** to identify concrete ways in which the department can support existing programs or help establish new programs.

b. **Provide resources**, including materials, classroom, and shop space, and part-time fabrication mentors to programs that need them.

c. **Develop an infrastructure for sponsoring undergraduate and graduate students** to provide part-time mentorship for outreach programs throughout the year via fellowships or course credit.

6. Empower the New Community Equity Officer and DEI Task Force

The Mechanical Engineering Department at MIT received funding from the institute to hire a Community Equity Officer (CEO) several months ago. While we are excited by the prospect of a powerful advocate within the department administration, simply hiring a CEO is insufficient. We must also empower this individual with specific responsibilities, namely to:

a. **Connect faculty and staff with resources** that improve their courses and lab environments with respect to DEI considerations.

b. **Hold faculty and staff accountable** for their demographic-specific hiring, attrition, and graduation rates. Specific accountability mechanisms must include the ability to (i) advise on raises and faculty promotions, including tenure decisions; (ii) advise on student hiring restrictions for faculty if problems are persistent, and (iii) reward faculty who demonstrate profound commitment to promoting DEI with bonuses and awards.41

c. **Arrange and track DEI and implicit bias training for all MechE labs**, a responsibility analogous to that of the EHS Coordinator.

d. **Regularly review the department’s hiring and undergraduate and graduate admissions practices.**

e. **Assess the current state of funding** for DEI efforts in the department.

f. **Improve and promote networking and career advancement opportunities** for URM students and faculty.

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g. **Act as a liaison for the MechE department** in coordinating an Institute-wide DEI effort.

Additionally, the department announced the creation of a departmental DEI Task Force. This task force should include the Faculty Diversity Chair, the CEO, additional faculty members, graduate and undergraduate representatives from various student groups, and possibly, local alumni. So far, the task force mandate is, “to define our community values and develop a 5-year diversity action plan,” but this charge requires greater granularity. In order to accomplish lasting change, the task force must:

a. **Conduct an initial literature review of evidence-based initiatives to improve diversity** in STEM and at institutions of higher learning (colleges, universities, medical schools, law schools, etc.), using the suggestions in this letter as a research guide.

b. **Incorporate DEI criteria into hiring and tenure decisions.**

c. **Evaluate the efficacy of existing DEI initiatives in the department.**

d. **Establish a confidential method for reporting race-based discrimination** to the department as well as a transparent way for the department to address these concerns.

e. **Facilitate communication with and garner input** from their peers in similar roles at MIT and other universities.

f. **Publish progress reports to the MechE community.**

g. **Meet regularly with the department head** to present refinements to the 5-year and 10-year diversity action plans.

h. **Present a progress report and collect feedback from any Visiting Committee** assessing the department.

i. **Routinely evaluate its membership and processes** to ensure that BIPOC and URM students and faculty are not disproportionately responsible for these commitments, as is often the case with DEI initiatives.42,43,44

j. Meet for the first time **no later than August 1st, 2020.**

Sincerely,

GAME DEI Working Group

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44 *It’s unfair to expect graduate students to shoulder all the diversity work (opinion)* | Inside Higher Ed.