

Diversity, Equity and Inclusion Plan for PhD Program Department of Civil and Environmental Engineering UNC Charlotte

Introduction and Goals:

The Department of Civil and Environmental Engineering participates in an NSF-sponsored initiative called AGEPC-NC via the ADVANCE Office. AGEPC stands for Alliances for Graduate Education and the Professoriate, and the goal of this NSF program is to increase the representation in STEM professoriate and research from the historically underrepresented demographics, specifically African Americans, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, and Native Pacific Islanders.

The primary goal of the AGEPC-NC project funded by the NSF AGEPC program is to create an environment in the participating departments where underrepresented minority (URM) PhD students can thrive, i.e. successfully complete their degree and be prepared to move on to a career of choice. To achieve this goal, initiatives that involve mentoring and professional development of PhD students are necessary. This proposal outlines steps to be taken by the Department to achieve this goal. It is important to note that the program is focused on PhD students, although all graduate students can benefit from it. Also, this program is not primarily aimed at increased recruitment or retention of URM students, but instead at their experience and journey as PhD students and their preparedness for the career of choice based on this journey facilitated by the Department. There is some emphasis on preparation for professoriate, as this is the aim of the NSF AGEPC program. However, the proposed activities allow the flexibility to prepare PhD students for their chosen path.

Background:

Our PhD program is new (started Fall 2019), and only 12 students have graduated from it with 16 students currently enrolled.¹ While 5 of our former and current students are Black (18%), none of them are African American. In fact, none of the 28 current and former students meet the NSF definition of URM. The breakdown of students by race, gender and international or domestic status is shown in Figure 1. Even though the AGEPC-NC project specifically does not have recruitment as one of the goals, our proposed plan has to and does include recruitment efforts. To date we had one URM applicant to our PhD program. That applicant was accepted but did not join the program. While GRE is a requirement for the application to the program, the test performance expectation set by the UNC Charlotte is 30th percentile, which cannot be considered exclusionary, and as a Department, we only enforce this standard for the quantitative portion of the GRE.²

¹ When the program started in 2019, the PhD students that were advised by the faculty in the Civil and Environmental Engineering Department were allowed to transfer most of their accumulated credits from the Infrastructure and Environmental System PhD program. This allowed for the very first student to graduate from the program the first semester the program started.

² Our MS program that has mainly domestic student population is currently 15% URM and 38% female. GRE is waived for applicants who graduate from UNC Charlotte programs.

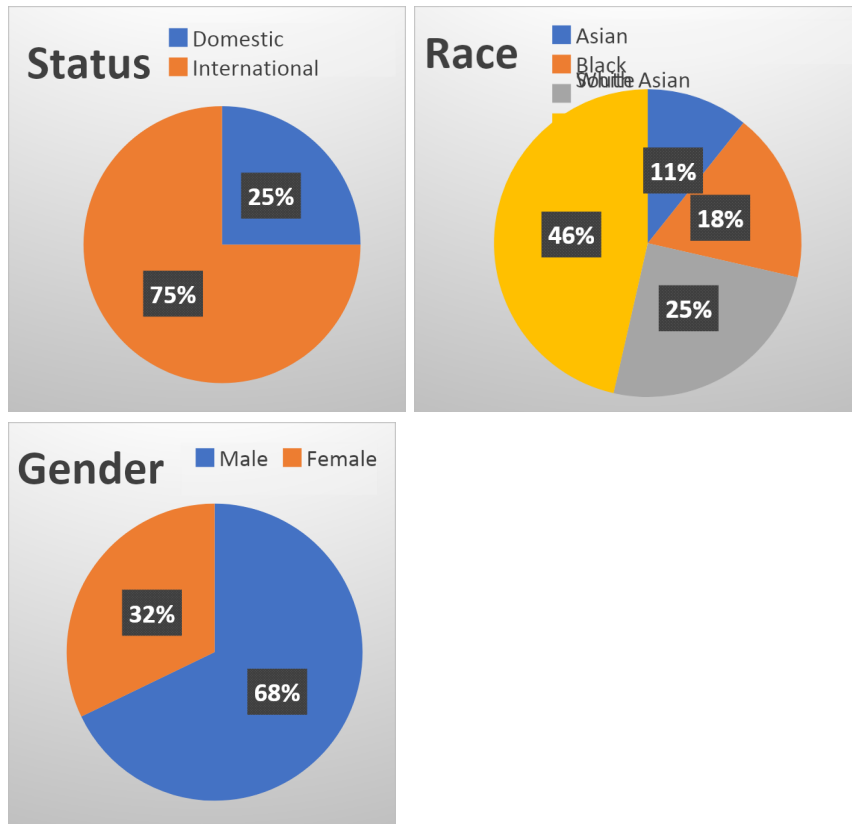


Figure 1: Breakdown of the student population by status (domestic or international), race, and gender.

Beyond recruitment, it is important to create an environment that allows URM PhD students to thrive once they are part of our program. As many URM students are also first-generation students, navigating post-graduate education may be confusing and discouraging if one does not know what to expect from this journey and has no peer support system or mentorship from those who have followed this path before. The most obvious mentor during PhD is the research advisor. However, advising and mentorship are not the same. The purpose of the proposed activities is to create an environment in the Department where PhD students have a clear understanding of the PhD experience and have a mentorship and support network of peers and senior professionals.

The current assessment of the program via the survey did not highlight any areas of particular problem. The exit survey conducted in the fall of 2021 captured the opinions of 11 of 16 students who were enrolled that semester (69% response rate). Of the surveyed students, all but 1 regarded the Department as a welcoming place to learn and work. In rating the program environment for minority students and women students, all of the surveyed students indicated that the conditions are good or excellent (with excellent representing the majority of the answers for both questions).

Some of the deficiency areas that can be identified from the survey are the opportunities to build a professional network and to participate in national conferences, opportunities to engage in teaching, communication with the advisor, and the livability of the stipend. Some of the

comments by students additionally identified lack of clarity on the qualifying exam and the opportunities to write journal articles. Some of the best experiences that students identify are opportunities to teach, learning from research projects, publishing papers and polishing their communication skills. Supportive mentors and being able to serve as a mentor to others were also identified as defining experiences. In the final comments the students expressed desire for more connection with other students and faculty and for career mentorship.

The original plan was developed prior to the exit survey results, however, the proposed activities capture what was learned from the survey and strive to provide clarity of expectations, opportunities to gain additional mentors and to mentor others, opportunities to engage with other students and faculty in a social setting, and enhanced professional development options that include developing teaching skills, presenting at national conferences, and career mentoring.

Departmental Plan:

Proposed activities are connected to create a pipeline of student mentoring and support and consist of the four elements described below.

1. **Outreach.** This element will consist of presenting opportunities that result from a graduate degree in Civil and Environmental Engineering to other departments at our university (e.g. Mathematics or Chemistry) and to other institutions in the area (in particular, minority serving colleges) that may have a diverse student body and may not be aware of the career pathways that open with a PhD degree from our department. Specific institutions for recruitment may be Historically Black Institutions Johnson C. Smith College (Programs in Math, Biology and Chemistry) to PhD via MS program; and NC A&T (Civil, Environmental and Architectural Engineering; Chemical, Biological and Bioengineering) directly to PhD. Other potential institutions and programs for recruiting that report high percentage of URM students are Queens University (Engineering Physics and Environmental Chemistry programs) to PhD via MS, and other colleges within ~2 hour driving distance from UNC Charlotte.

Responsible Parties: Graduate Program Director and Graduate Advisor

Continuity: Recruitment is part of the expected tasks for the responsible parties identified. Materials, protocols and contacts developed under this effort will be transferred to the next individual taking over the position in the event of staff changeover.

Assessment: Increased percent of URM students in the graduate program. The progress may be reflected in the MS program prior to becoming evident in the PhD program, as some of the students may enter the PhD program via being recruited to the MS program first.

Progress: The responsible parties identified a short list of the programs to establish recruiting relationships. Counterparts in the identified programs are being contacted to establish initial interest and to schedule information sessions for prospective students.

2. **Welcome.** The scope of the effort of creating a welcome atmosphere for incoming students will consist of the following sub elements:
 - a. Creating a carefully crafted and worded welcome package/handbook to the incoming students that encompasses inclusiveness and emphasizes establishing mentoring relationships. The welcome document/handbook will also outline standardized expectations of the mentor and mentee and provide the logistical information to the students for the milestones and resources available for the

successful completion of the degree. The goal of the document is to take the burden off the students in figuring out what is expected of them, and what they should expect of their advisor/mentors and their graduate education. As many URM students are first-generation students, they may not be familiar with the structure of graduate education, what opportunities are available to them, and do not have anyone in their immediate circle to ask certain questions. There may be a fear to ask an “obvious” question. The goal of the document is to anticipate potential questions and to provide clarity on the graduate life, procedures of obtaining the graduate degree, and establishing mentoring relationships. The document will be kept in an electronic format accessible from the Department’s website and will continue evolving. The goal is also to standardize the expectations put by faculty onto students to give students a clear understanding of when they are ready to graduate.

Responsible Parties: *Graduate Program Director and Graduate Advisor with input from faculty*

Continuity: *The document will be available to the students in the program online indefinitely after the initial draft is developed. If no dramatic changes happen to the program, the availability of this document online assures the continuity of this effort.*

Assessment: *A student survey will be conducted to make sure that all the necessary elements are covered by the documents. Edits will be done based on the feedback from the students regarding the information they would like to see in the document.*

Progress: *The document is approximately 25% complete at the time of this proposal revision (4/18/2022), and is expected to be finalized before the beginning of the fall semester of 2022.*

- b. Assigning a senior graduate student mentor to each incoming student. The student mentor will be someone who spent at least 5 semesters in the program and has research closely aligned with the mentee. The students will be asked to volunteer as mentors rather than being required to, and will be directed to existing online resources to understand mentorship and guidelines for structured support for their mentee. As the process matures, a more formal structure may be put in place that would require students to be trained in the skill of mentoring.

Responsible Parties: *Graduate Program Director and Graduate Advisor, with input from the student’s research advisor*

Continuity: *This process already exists informally, so even in the event of the change in leadership, it can continue in some form. It will be written into the graduate student handbook so that the students can take ownership of it.*

Assessment: *A question will be added to the annual graduate student survey regarding their satisfaction with mentorship they receive, which will include the assessment of peer mentorship.*

Progress: *The process has not been initiated or formalized yet. The target date for the first round of mentor-mentee pairings is the fall semester of 2022.*

3. **Ongoing support.** This task will consist of the following elements:
 - a. Creating an individual development plan (IDP) template and/or mentor/mentee contract with feedback from all faculty involved in advising and mentoring

graduate students. The students and advisors will be encouraged to take tests identifying communication styles and supervising styles to find the gaps in understanding each other and to work out a plan for an effective relationship. The graduate program director may serve as a mediator, if necessary.

Responsible Parties: Graduate Program Director and Graduate Advisor for creating an initial template and approving modifications based on faculty input; student's advisor for administering IDP and annual check-ups.

Continuity: The discussion of IDPs will be part of graduate student's handbook, so the students can take ownership over completing the IDP and initiating the discussion with the advisor. Additionally, we will consider making the IDP a formal milestone for the PhD students.

Assessment: Since this is not a formal milestone at this time and the completion of IDPs is voluntary, the participation rate will be tracked.

Progress: The IDP template has been developed, formally adopted, and the current students received a training session on IDP use. The students completed the IDPs and had meetings with their advisors to discuss them. The IDP sessions for incoming students will be conducted in January.

- b. Encouraging faculty professional development in the art of mentoring, and learning the differences between mentoring and advising. Emphasizing the importance of forming the mentoring relationship with the student. Existing resources will be utilized, such as workshops offered by the ADVANCE Office. Speakers may be invited to departmental faculty meetings if not all of the faculty who advise PhD students voluntarily attend appropriate workshops.

Responsible Parties: Department Chair and Graduate Program Director engaging faculty via external resources.

Continuity: There are continuous announcements about mentoring resources available that are sent to faculty via the Graduate Program Director or through direct communication from ADVANCE Office. The GPD is to discuss with the Department Chair adding mentoring as part of the RPT package narrative.

Assessment: Tracking completion of mentor training by faculty. Quality of the RPT narrative that addresses mentoring.

Progress: Ongoing communications are sent to the faculty encouraging training. The addition to the RPT requirements is to be discussed with the Department Chair.

- c. Having annual feedback meetings with graduate students as a group to receive suggestions on continuous improvement of the mentoring and student support process. PhD students will also be asked to set up individual meetings with the graduate program director at least once a year or anytime additionally if they have sensitive topics that need attention.

Responsible Parties: Graduate Program Director

Continuity: Currently there is no document that outlines the duties of the GPD. This document will be created and will include receiving feedback from the graduate students and taking appropriate action as part of the responsibilities of the GPD.

Assessment: Student satisfaction with the method to collect feedback will be included as part of the annual survey.

Progress: The first feedback meeting was a success and provided a number of valuable suggestions for improvement. The next survey will be conducted in early May to determine the continuous improvement agenda for the upcoming year.

- d. Other activities to build a sense of community among students: Group research meetings, seminars on graduate life, workshops on professional skill building: CV development, interviewing, putting together application package for faculty jobs, scientific writing, oral and poster presentation skills, etc. To the extent possible, existing university resources will be engaged for this purpose.

Responsible Parties: Graduate Program Director and Graduate Advisor, area coordinators, research advisors, invited speakers, external resources

Continuity: Ongoing community building opportunities will eventually become an expectation by students, and in the event of the change in leadership, the students will be able to request such events to continue during the annual survey. While there is no formal mechanism to assure that this continues, weaving it into the departmental culture and making it an expectation by the students and their mentors is expected to assure the continuity of such activities.

Assessment: General sense of community as communicated by the students on the annual survey.

Progress: The Department has held two social events for the students so far with one more planned in the upcoming weeks. The Department has also committed funding for these events.

4. **Setting up for future success.** The students will be provided with the opportunities to connect with professionals in the positions where they envision themselves. To the extent possible, the effort will be made to connect each student with a professional that they can identify with. A student questionnaire will indicate if they prefer to be connected to someone in their age group, race, gender, family status, veteran status, etc. Existing collaborations with the industry and academia available through the faculty networks will be built upon to recruit the professional mentors.

Responsible Parties: Research Advisor, Graduate Program Director, Department Chair

Continuity: The responsibility for connecting students with mentors in their discipline will eventually be transferred to the research advisors after the initial period. This effort by the research advisor will become part of their RPT narrative on effective mentoring.

Assessment: Student satisfaction with access to external mentors and quality of external mentoring will be assessed during annual surveys.

Progress: This is an item in progress at this time and the process is still being developed, communicated and formalized.