

Office of the President

TO MEMBERS OF THE ACADEMIC AND STUDENT AFFAIRS COMMITTEE:

DISCUSSION ITEM

For Meeting of May 17, 2017

**ACCOUNTABILITY SUB-REPORT ON DIVERSITY: GRADUATE ACADEMIC
STUDENT DIVERSITY OUTCOMES**

EXECUTIVE SUMMARY

The Annual Accountability Sub-Report on Diversity at the University of California is prepared as part of ongoing efforts to ensure greater accountability across the UC system and utilizes data contained in the 2016 University of California Accountability Report.¹

The May 2017 sub-report provides an overview of graduate academic student enrollment trends and outcomes, financial aid and fellowship support, and time-to-degree, with a particular focus on the racial/ethnic and gender composition of students in doctoral degree programs.

Key findings include the following:

- Enrollment of underrepresented racial/ethnic minority (URM) and female students has grown in UC's academic doctoral programs over the last decade.
- UC awarded academic doctoral degrees to URM students in higher proportion than did its peers, in every discipline. UC graduated roughly the same proportion of women in academic doctoral degree programs as peer institutions.
- UC offers competitive financial support packages in order to attract a diverse, highly qualified pool of graduate students. Doctoral students in science, technology, engineering and mathematics (STEM) fields typically receive more research assistantship support (earnings and tuition/fee remission) than those in other fields due to the greater availability of research grants. Those in social sciences, arts, and humanities typically rely more on teaching assistantship support (earnings and fee remission).
- The time-to-degree for doctoral degree programs varies slightly by race/ethnicity and is about the same by gender. UC's time-to-degree for URM and female doctoral students is on par with that of its peer institutions.

¹ <http://accountability.universityofcalifornia.edu/2016/>

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The presentation accompanying the May 2017 sub-report will also include a discussion with campus representatives on selected best practices in graduate academic student diversity.

BACKGROUND

UC's goals with respect to graduate academic education are to offer outstanding degree programs, to support research and undergraduate instruction, and to prepare a professional workforce across all disciplines. The California Master Plan for Higher Education charges UC as the primary academic research institution in the state and as such, UC is given exclusive jurisdiction in public higher education for doctoral degrees with some exceptions (e.g., Ed.D. and joint doctorates). UC awards academic doctoral and academic master's degrees in the physical sciences, social sciences, arts, humanities, and engineering/computer science. The largest proportion of graduate academic degrees awarded at UC is in the STEM fields. In 2014-15, about half of UC graduate academic degrees awarded were in STEM.

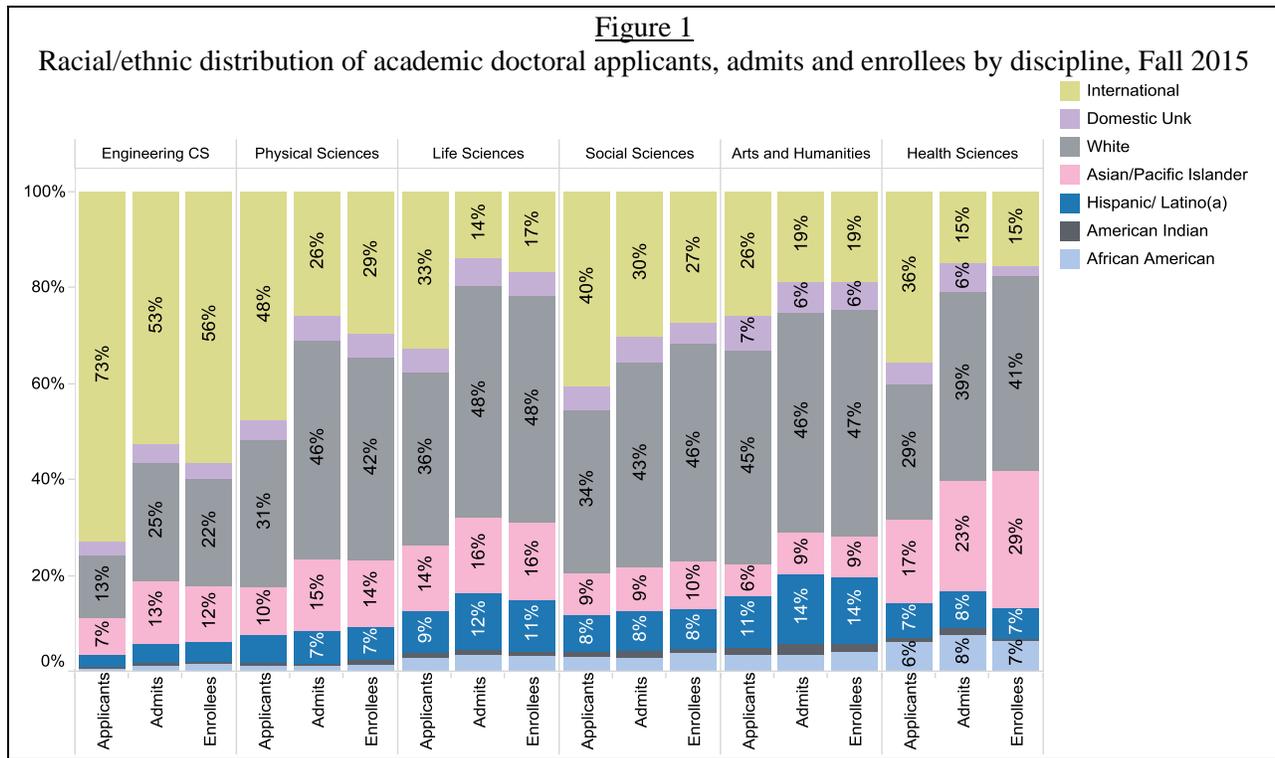
UC awards academic master's degrees and doctoral degrees. Academic master's degrees (e.g., M.A., M.S.) provide an introduction to research and advanced study, and may be terminal in nature or may serve as a pathway to advanced study at the doctoral level. Academic doctoral degrees (e.g., Ph.D.) are terminal in nature and awarded for successfully completing independent research presented in the form of a dissertation. Of the 30,603 students enrolled in UC graduate academic degree programs in 2016, the vast majority (78 percent) are enrolled in doctoral degree programs, and are the focus of the data in this report.

As a world-class research institution, UC seeks students from across the state, nation, and around the world for its graduate academic degree programs. As a consequence, UC's efforts to diversify its undergraduate student population can also help to diversify its graduate academic population. Moreover, because recent Ph.D.s constitute the pool for new faculty, a critical means of increasing the diversity of the faculty is to increase the diversity of the pool of academic doctoral degree recipients. UC's own undergraduate degree recipients make up about one-tenth of UC's graduate academic students.

FINDINGS

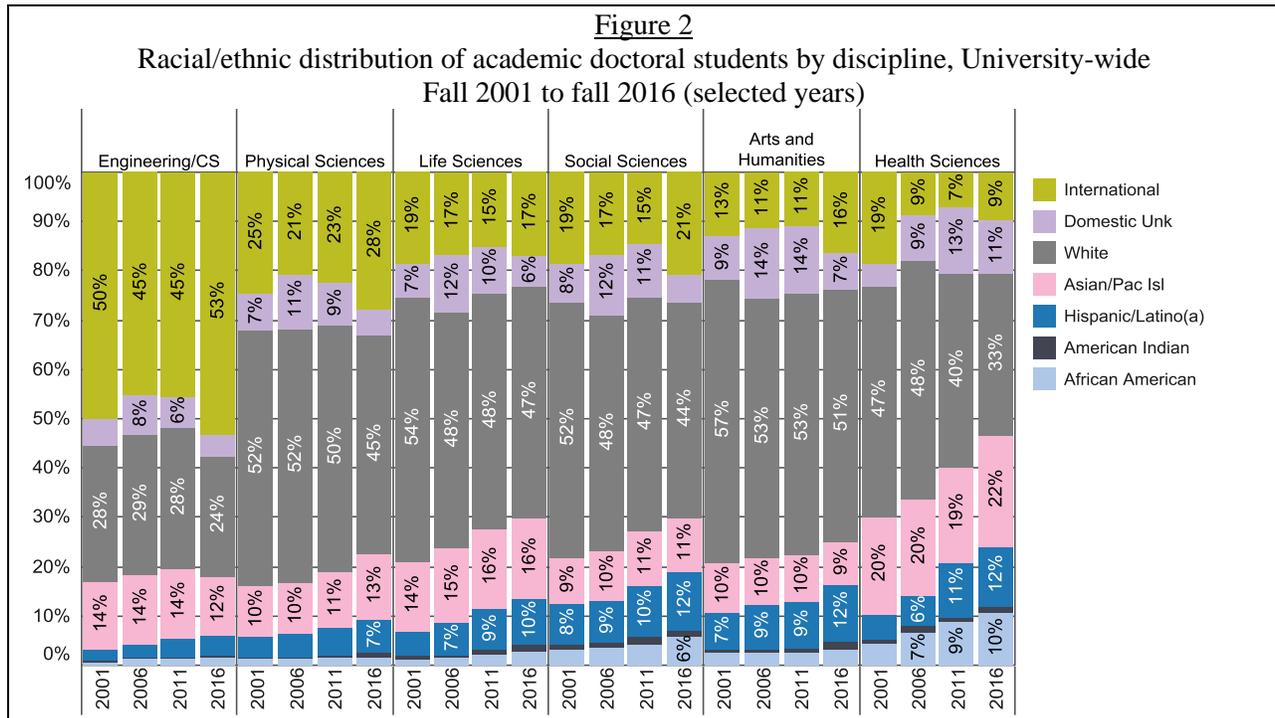
Demographic characteristics of academic doctoral students

Demand for UC academic doctoral degree programs is very high. In 2015, UC received about 58,600 applications for academic doctoral degree programs. Of these, 10,600 applicants — about 18 percent — were admitted, and 4,300 enrolled. The number of applications for academic doctoral admission has grown by about 25 percent over the last ten years, with the largest increase in applications from international students.



As shown in Figure 1, applications to academic doctoral programs in STEM fields are predominantly from international students, with international students making up 73 percent of applicants in engineering/computer science, 48 percent in physical sciences, and 33 percent in life sciences. However, domestic students make up the majority of admits and enrollees in all disciplines except engineering/computer science.

Figure 2 shows that the enrollment of underrepresented minority students (URM) has grown in UC's academic doctoral programs over the last decade. Social sciences have the highest proportion of URM students in fall 2016 at nearly 20 percent. URM enrollment in the STEM fields has grown but remains lower, at six percent in engineering/computer science, nine percent in physical sciences, and 14 percent in the life sciences.



In 2014-15, UC awarded academic doctoral degrees to underrepresented racial/ethnic groups in higher proportion than did its peers, in every discipline.

Proportion of underrepresented racial/ethnic groups receiving academic doctoral degrees

2014-15	Other AAU		AAU
	UC	Public	Private
Social sciences	12%	10%	8%
Arts & humanities	12%	8%	7%
Life sciences	12%	6%	9%
Physical sciences	7%	4%	4%
Engineering & computer science	5%	4%	4%

Source: IPEDS

The proportion of female academic students varies by discipline, as shown in Figure 3. Half or more of the graduate academic students in the life sciences, social sciences, arts and humanities, and health sciences are female, compared with almost one-in-three in the physical sciences, engineering, and computer science.

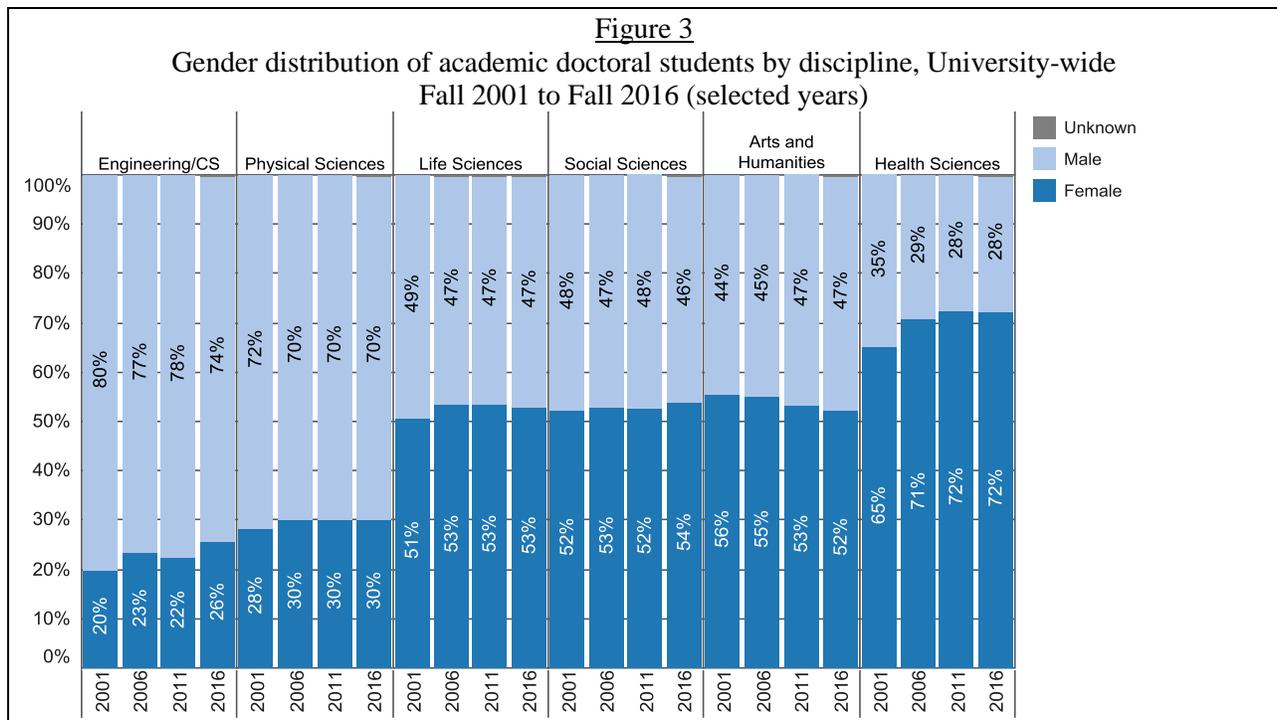
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As shown in the table below, UC graduated roughly the same proportion of women in academic doctoral degree programs as the comparison Association of American Universities (AAU) peers — somewhat higher in arts and humanities and life sciences and somewhat lower in physical sciences, engineering, and computer science.

Proportion of women receiving academic doctoral degrees

2014-15	UC	Other AAU Public	AAU Private
Social sciences	53%	57%	50%
Arts & humanities	53%	52%	52%
Life sciences	53%	52%	54%
Physical sciences	31%	33%	30%
Engineering & computer science	21%	22%	25%

Source: IPEDS



Financial support of academic graduate students

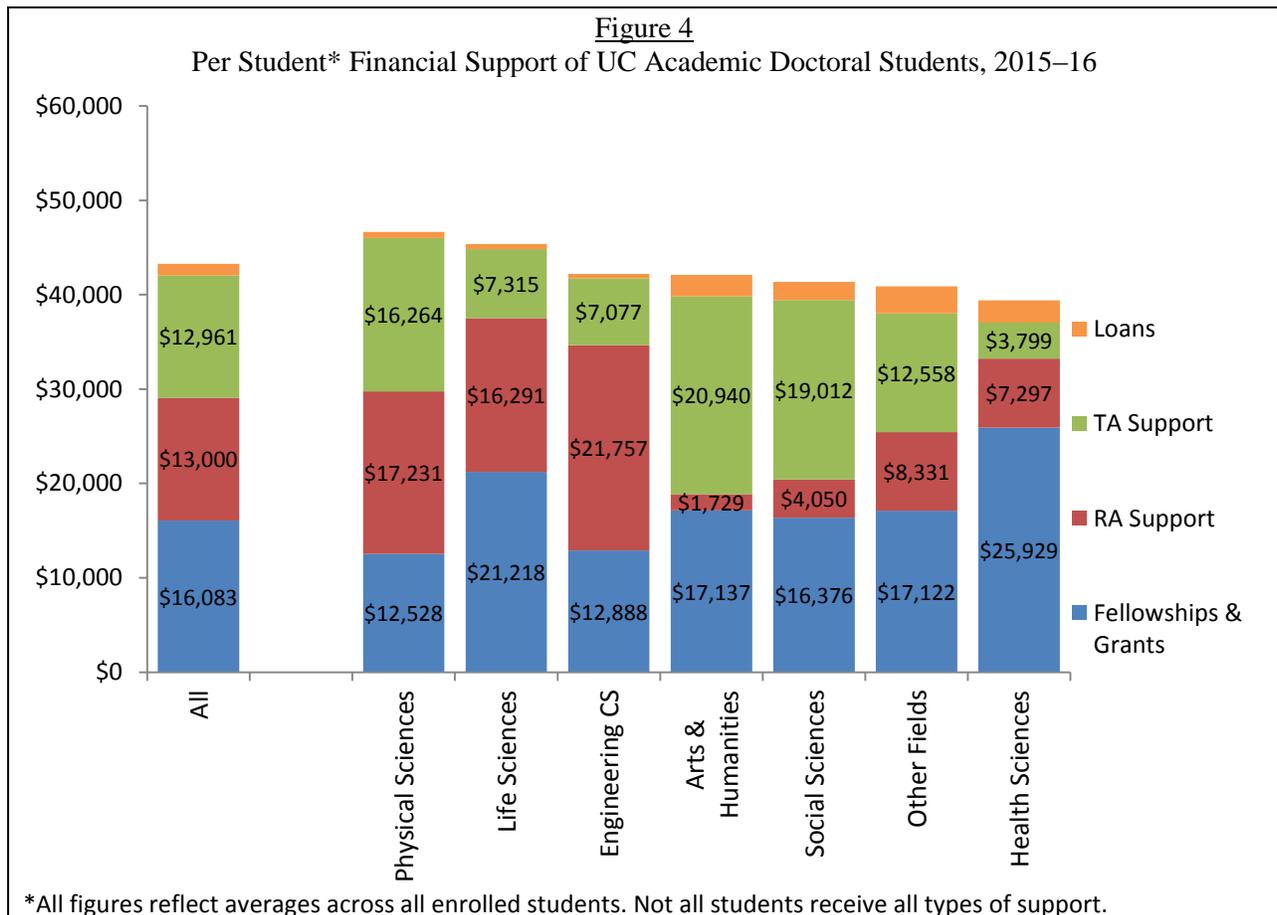
Although data on financial support packages disaggregated by race/ethnicity or gender are not readily available, we do know that competitive financial support packages are needed in order to attract a diverse, highly qualified pool of graduate students. Academic graduate student financial support comes from a combination of fund sources, including fellowships (external to UC and UC-funded), on-campus appointments as a graduate student researcher (GSR) or teaching

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assistant (TA), other opportunities for earnings on or off campus, savings, family contributions, and/or loans. Net stipend is the amount of aid that students have for living expenses after tuition and fees are paid. Typical financial support packages for selected disciplines are shown in Figure 4.

The goal of graduate financial support differs substantially from that of undergraduate financial support. Support for graduate students is intended not simply to make the University accessible, but also to help encourage top students to choose UC over other institutions for graduate study. Graduate student financial support is an important recruitment tool, the success of which is tied closely to whether the University’s offers of financial assistance are competitive with those made by other universities competing for the same students. Graduate-level assistance at UC is distributed largely based on merit in order to increase its effectiveness at recruiting strong graduate students. Doctoral students typically receive financial support that exceeds tuition and required fees, and the amount remaining after charges is referred to as the “net stipend.”

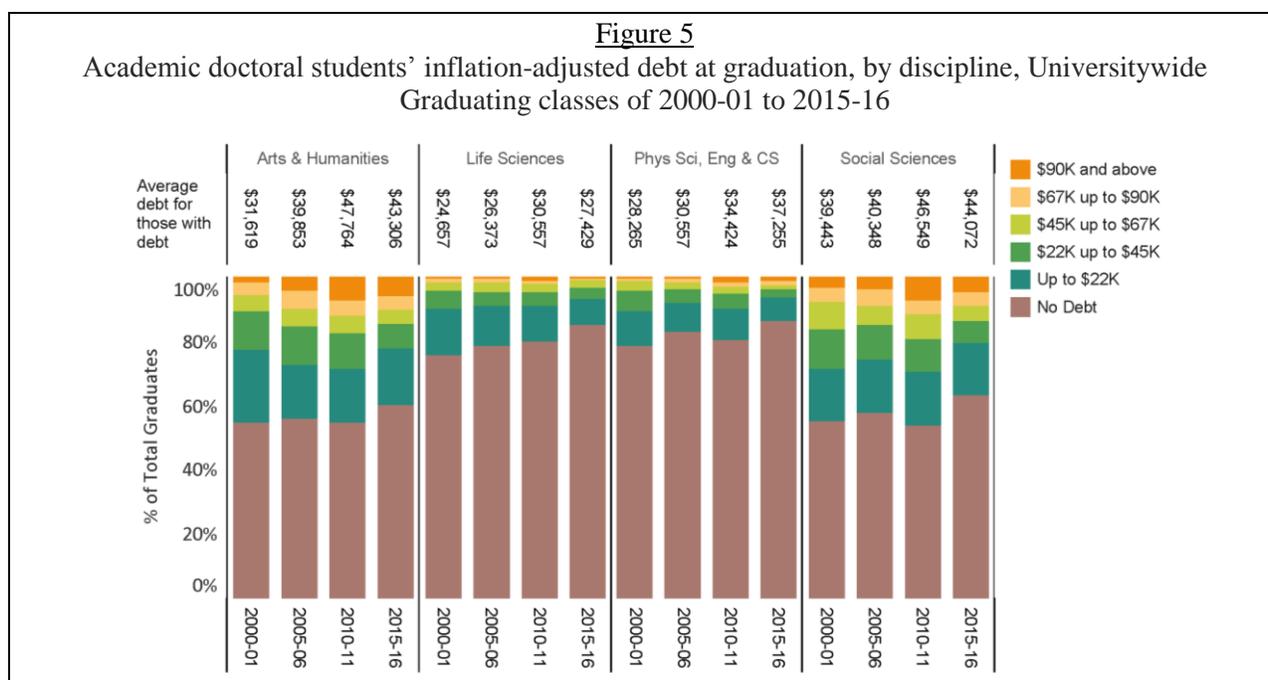
Doctoral students in STEM fields typically receive more research assistantship support (earnings and tuition/fee remission) due to the greater availability of research grants. Students in social sciences, arts, and humanities typically rely more on teaching assistantship support (earnings and fee remission).



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Debt from student loans is another indicator of financial support. As shown in Figure 5, about 85 percent of doctoral graduates in the life sciences, physical sciences, and engineering/computer science fields graduated with no debt, compared to about 60 to 65 percent of doctoral graduates in the social sciences and arts and humanities. Moreover, the percentage of doctoral students graduating with *no* debt has increased by five to ten percentage points over the last 15 years depending on the discipline. Figure 5 also shows the average debt of borrowers at the time of graduation. Doctoral students in the physical sciences and engineering/computer science graduate with average debt of about \$37,000 compared with, for example, average debt of \$44,000 for doctoral students in the social sciences. The average debt of those who borrow has trended upward over the last 15 years.

Several factors account for the difference in debt burden between doctoral students in the physical and life sciences and those in other disciplines. For example, as noted in Figure 4, physical and life science students are more likely to be supported by a combination of research fellowship grants, and research assistant positions, compared with the students in the arts, humanities, and social sciences.



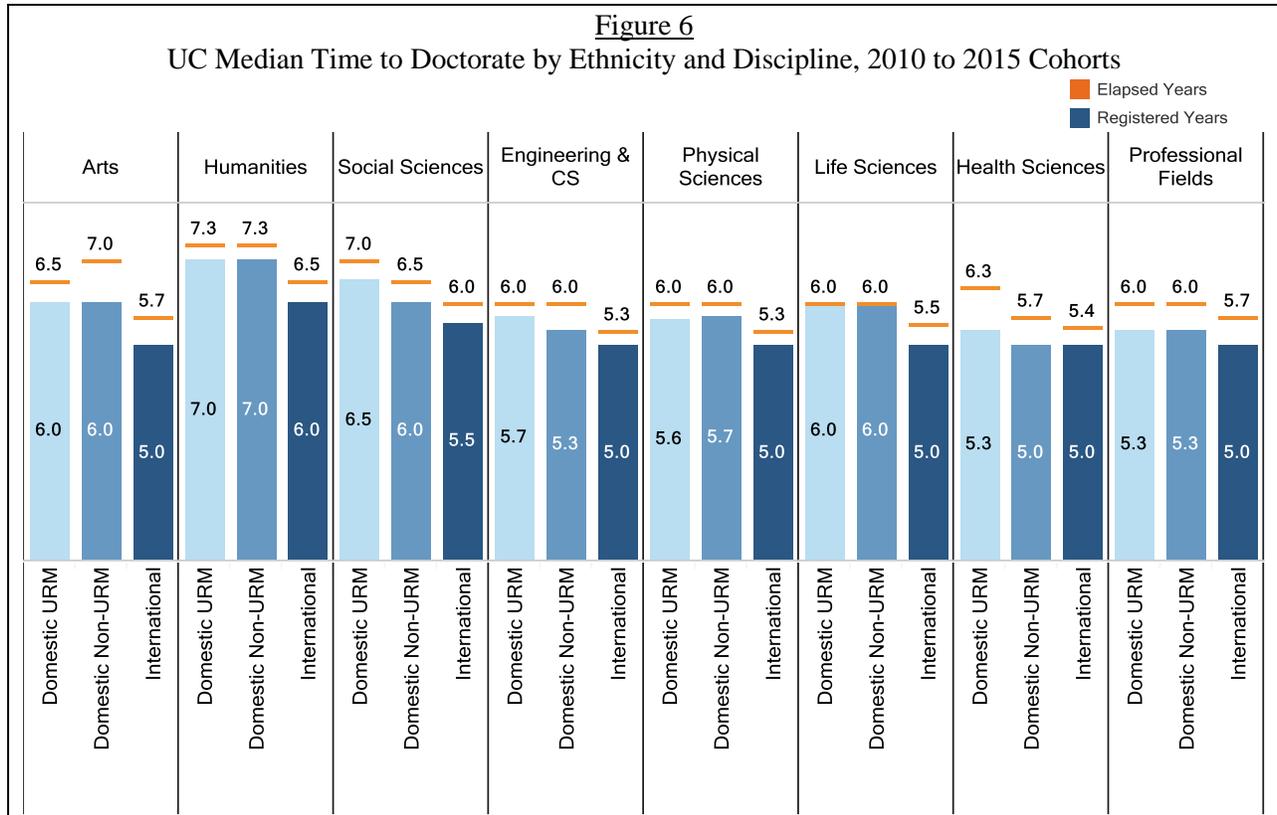
Doctoral time-to-degree

The amount of time taken to complete the doctoral degree is an important measure of both institutional effectiveness and student success. UCOP regularly conducts systemwide time-to-doctorate studies to track the progress of UC doctoral students, with the most recent study conducted in 2016. Time-to-doctorate varied somewhat by ethnicity. The median elapsed time-to-degree for URMs and non-URMs were 6.3 years and 6.0 years, respectively. However, if only

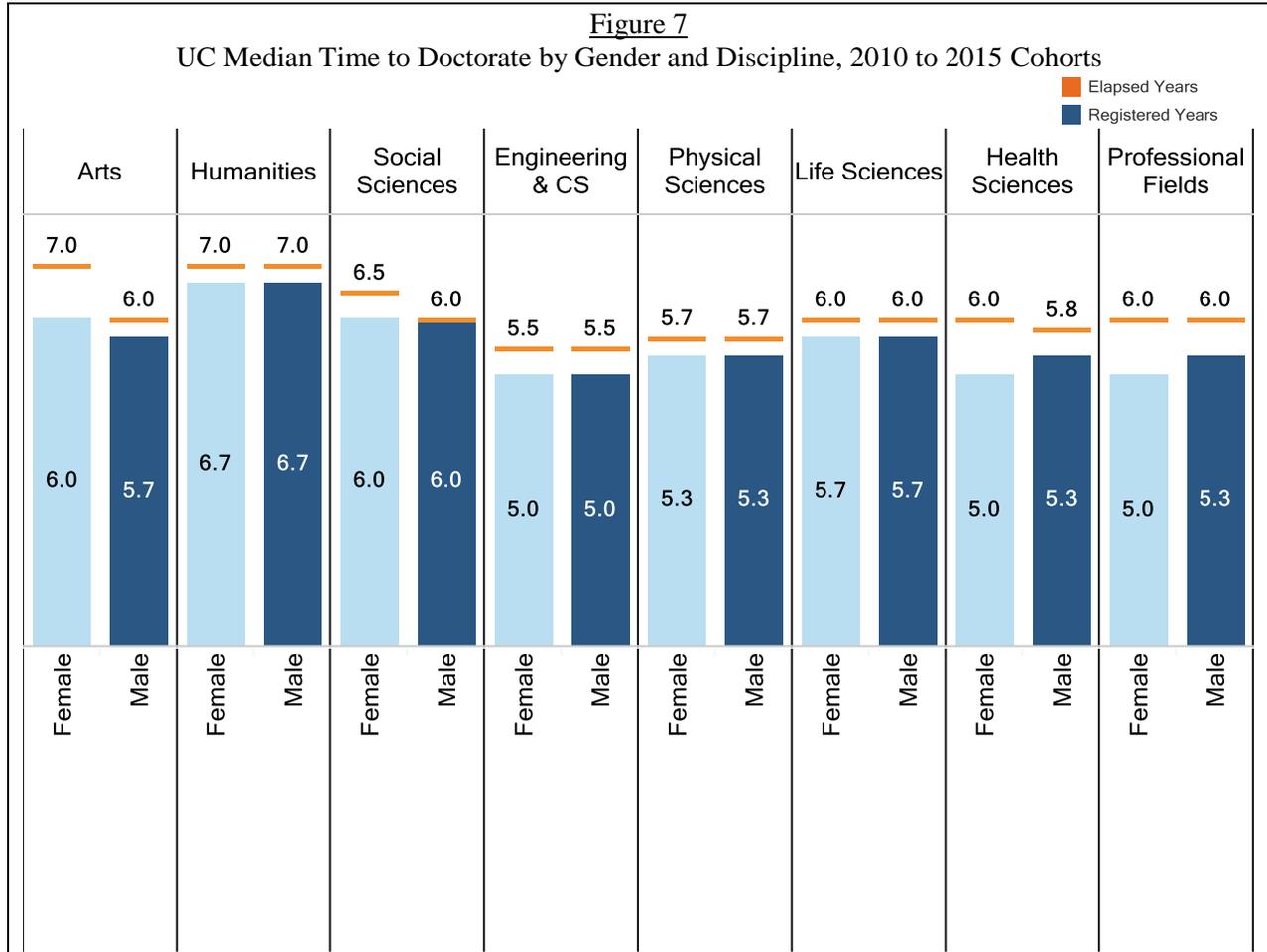
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enrolled terms are counted, then time-to-degree for both URM and non-URM is 6.0 years.

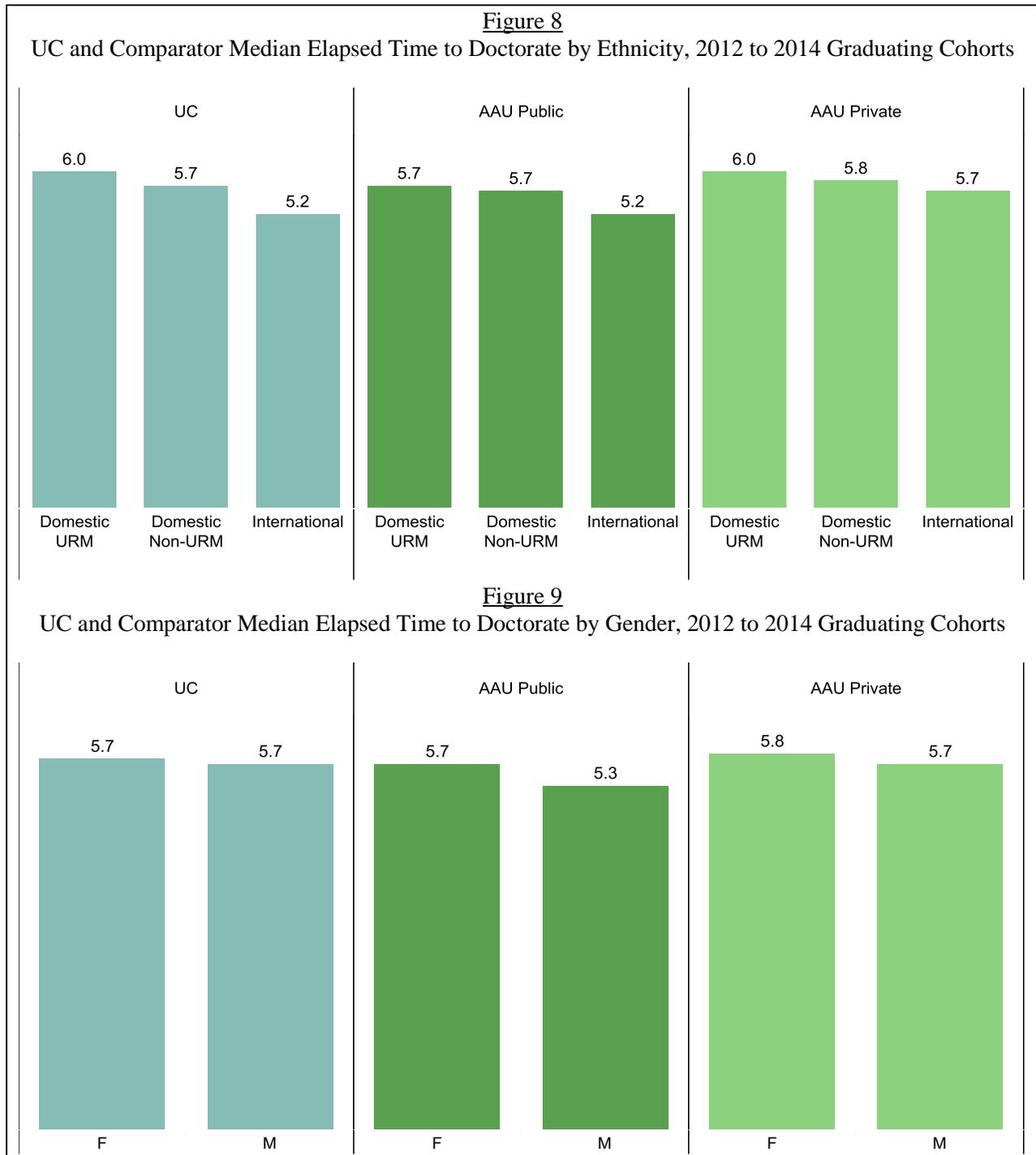
Across disciplines, URMs had a longer elapsed time-to-degree for the academic doctorate than did non-URMs in humanities, health sciences, and professional fields, and about the same elapsed time-to-degree as did non-URMs in arts, social sciences, engineering/computer science, physical sciences, and life sciences. International students have the shortest elapsed time-to-degree in nearly all disciplines (Figure 6).



In terms of gender, female doctoral students have the same elapsed time-to-degree as do males except in social sciences — where females have a slightly longer time-to-degree — and in health sciences, where women have a shorter time-to-degree (Figure 7).



Figures 8 and 9 show that elapsed time-to-degree for URM and female doctoral students is on par with time-to-degree rates of other AAU institutions. However, URMs at AAU publics have slightly shorter elapsed time-to-degree than do URM students at UC (Figure 8). Female doctoral students at UC have the same elapsed time-to-degree as do female students at AAU public institutions and a slightly shorter time-to-degree than at AAU private institutions (Figure 9).



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Selected best practices in graduate academic diversity

In recent years, UC has increased its investment in academic and research preparation programs for graduate academic students. Campus and systemwide efforts have been developed to help address the critical role of mentoring in preparation for graduate school and to be successful Ph.D. students. Examples of best practices in graduate academic diversity preparation efforts include the following programs:

UC-HBCU Initiative:

The goal of the UC-HBCU Initiative is to increase the number of African Americans completing Ph.D.s at UC. The Initiative seeks to do so by increasing the number of HBCU graduates in UC Ph.D. programs by investing in relationships between UC faculty and Historically Black Colleges and Universities (HBCUs). Grants are competitively awarded to UC faculty members to host HBCU student summer research interns and to facilitate faculty research collaborations and other educational activities between UCs and HBCUs that serve the goals of the initiative. The Office of the President also offers cost-share fellowship funds in an effort to help programs offer competitive funding packages to successfully recruit these scholars. The UC exposure, research experience, and sustained structured mentoring for HBCU students, coupled with a competitive funding package, can make a tremendous difference in enrolling students and facilitating a good start to their UC graduate career. The yield rate for interns from this program admitted to UC Ph.D. programs is an impressive 82 percent. The Initiative helps cultivate a network of success support by providing professional development and engagement opportunities in addition to campus efforts. Since summer 2012, UC has hosted over 315 HBCU student scholars across nine UC campuses. More than 90 fellows are expected to conduct research at nine campuses during summer 2017. Twenty-seven Ph.D. students and two M.A. students are currently enrolled at UC, and three M.A. students have already graduated as a direct result of this initiative. The first Ph.D. recipient from the Initiative recently filed for the dissertation.

University of California Leadership Excellence through Advanced Degrees:

The University of California's Leadership Excellence through Advanced Degrees (UC LEADS) program prepares promising UC undergraduate students for advanced education in science, technology, mathematics and engineering (STEM) fields. Upper-division students with the potential to succeed in these disciplines – but who have experienced situations or conditions that have adversely impacted their advancement in their field of study – may participate in the program. Once chosen as UC LEADS Scholars, the students embark upon a two-year program of scientific research and graduate school preparation guided by individual UC faculty mentors. From the inception of UC LEADS in 2000–01 through the 2014–15 cohort, 785 scholars have participated in the program. Given the importance of ensuring gender equity within STEM-based doctoral programs, it is notable that 389 (49.5 percent) of the 785 UC LEADS scholars are female. Also of note, 376 (48 percent) of scholars are from underrepresented minorities. Of the first 12 cohorts (649 students), 633 (98 percent) have earned their undergraduate degrees. Subsequently, 446 of these 633 students (70 percent) are either currently enrolled in graduate

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school or have already earned graduate degrees in a variety of doctoral and master's programs. Moreover, twelve UC LEADS alumni are now serving as tenure-track faculty, including four within the UC system.

Other programs to prepare URM and female undergraduate students for graduate school:

All UC campuses have programs designed for undergraduates who wish to learn more about the graduate school experience and possibly pursue an academic career in teaching and research. Examples of such programs include **Summer Programs for Undergraduate Research (SPUR)** at UCLA and the federally funded **McNair Scholars Program** at UC Berkeley, UC Davis, UCLA, and UC San Diego. As another example, UC Berkeley, UCLA, and UC Riverside are member institutions of the **Mellon-Mays Undergraduate Fellowship** program that provides academic and financial support to undergraduates interested in pursuing doctoral degrees and careers in the professoriate.

UC and California State University collaborations and partnerships:

UC also collaborates with the California State University (CSU) Chancellor's Office on various pipeline efforts. Of particular note is **the California State University Sally Casanova Pre-Doctoral Scholars program**. Founded in 1989 by CSU and UC, the program supports doctoral aspirations of CSU students who demonstrate academic excellence while having experienced economic or educational disadvantage. Scholars receive ongoing faculty mentoring and may conduct summer research at any institution, and UC conducts outreach in an effort to attract students to UC campuses to conduct summer research and consider UC for doctoral study. The program targets students interested in a career in teaching and research at the college or university level. About 25 percent of faculty at CSU and UC hold doctorate degrees from the University of California. UC participates on the advisory board of this CSU program.

Mentoring:

In addition to investments supporting academic and research preparation of potential Ph.D. students, UC makes considerable investments in the mentoring and support of enrolled academic doctoral students who contribute to diversity. Investments include strategic campus programming, use of layered mentoring, and other structured efforts such as:

- **Eugene Cota-Robles Fellowship:** All of the campuses award the Eugene Cota-Robles fellowship, which facilitates the academic career development of students who show potential to become excellent faculty or researchers in institutions of higher education as well as to foster multifaceted diversity in graduate education at the University of California.
- **Dissertation-Year Fellowship:** All of the campuses award the Dissertation Year Fellowship. This program assists students in completing the Ph.D. and facilitates support for pursuing university faculty teaching and research appointments. The program offers support for outstanding Ph.D. candidates working on completing their dissertation. It

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provides faculty mentorship, information, and advice as students prepare to become postdoctoral fellows or consider other career opportunities. Fellows are invited to participate in a special mentoring and professional development opportunity as part of the annual President's Postdoctoral Fellowship Program Fall Meeting.

- **Competitive Edge** is a summer transition program with research and professional development experiences to enhance student success for newly admitted and entering doctoral students in the STEM fields (and other fields depending on the campus). Competitive Edge provides faculty-guided research and mentoring during the program. It allows students to begin their research while getting acclimated to campus resources and opportunities before the fall term officially starts. Competitive Edge students are often brought together during the academic year to network and build additional mentoring relationships. UCLA, UC Irvine, UC Riverside, UC San Diego, and UC Merced have Competitive Edge-type programs.
- UC San Diego and UCLA have chapters of the **Bouchet Graduate Honors Society**, a network of preeminent scholars across participating institutions who exemplify academic and personal excellence, foster environments of support, and serve as examples of scholarship, leadership, character, service, and advocacy for students who have been traditionally underrepresented in the academy. A faculty advisory group across disciplines participates in the selection and networking opportunities as part of the program.
- The **California Alliance** is a collaboration between four premier doctoral degree-granting institutions in California, the University of California at Berkeley, UCLA, Stanford University, and California Institute of Technology and is funded by the National Science Foundation. For the first time, the California Alliance has engaged four of the nation's most prominent universities for joint mentorship, scientific collaboration, career development, and guidance of advanced Ph.D. students and postdoctoral fellows. The California Alliance Research Exchange will support a visit to a research group at any of the partner institutions.
- **Center for the Integration of Research, Teaching and Learning (CIRTL)** is a STEM pedagogy training program for graduate students. As a part of the program, advanced students work with a faculty mentor on teaching as research projects. UCI, UCLA, and UCSD are the hubs in the CIRTL Network.
- **Entering Mentoring Training at UCLA** is an eight-week curriculum based on the model: "Entering Mentoring: A Seminar to Train a New Generation of Scientists," by J. Handlesman et al., 2009. The seminar targets graduate students and postdoctoral scholars in the sciences and uses a student-centered, interactive approach.

The programs and efforts noted are representative of the type of engagement across the campuses that helps foster a solid foundation for success for academic doctoral students, particularly those who may be first-generation, from underserved communities, and/or from backgrounds

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historically underrepresented in Ph.D. programs at UC. Campuses are committed and are working in partnership to foster a more inclusive environment designed for the success of all students.

Key to Acronyms

AAU	American Association of Universities
CIRTL	Center for the Integration of Research, Teaching and Learning
CSU	California State University
GSR	Graduate student researcher
HBCU	Historically Black Colleges and Universities
SPUR	Summer Programs for Undergraduate Research
STEM	Science, Technology, Engineering, Mathematics
UC LEADS	UC Leadership Excellence through Advanced Degrees
URM	Underrepresented minorities (American Indian/Native American, Black/African American, Chicano/Latino/Hispanic). U.S. domestic only.