



GRADUATE ENROLLMENT AND DEGREES

2012-2022

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The CGS/GRE Survey of Graduate Enrollment and Degrees is jointly sponsored by the Council of Graduate Schools (CGS) and the Educational Testing Service (ETS). For more information about the survey or the survey reports, please contact:

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September 2023

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OVERVIEW

Master's and doctoral-level education equips individuals with advanced knowledge to address issues such as climate change, wars and civil conflict, public health crises, rising inflation rates, food insecurity, and the use of artificial intelligence technology in our daily lives. This year's Graduate Enrollment and Degrees report (GE&D) provides important data on the graduate student pipelines that shape the U.S. workforce of tomorrow. Specifically, the 2023 GE&D report provides analyses of trends in domestic and international student applications, admissions decisions, and enrollments for higher education leaders. To be sure, the overall outlook for the graduate education community remains positive, evident by increasing applications for admission to U.S. graduate schools. Nonetheless, graduate institutions are beginning to experience the slowing enrollment growth trends that challenge the higher education sector as a whole. Equally important, the strong U.S. job market which college graduates enjoyed when the GE&D survey was administered, might have contributed to declines in domestic enrollment that are chronicled in the present report¹. The GE&D report also comments on patterns of declining enrollments for underrepresented groups between Fall 2021 and Fall 2022. Taken together, the Council of Graduate Schools hopes these findings will assist leaders and policymakers in improving and advancing graduate education.

¹ <https://www.bls.gov/opub/mlr/2022/article/job-openings-and-quits-reach-record-highs-in-2021.htm>

QUICK TAKES

The CGS/GRE Survey of Graduate Enrollment and Degrees is a leading source of information on master's and doctoral program applications, enrollment, and degrees conferred in the United States. Below are key points from the Fall 2022 Survey.

HIGHLIGHTS BY SELECTED INSTITUTIONAL TYPES

► **Applications for Admission.** Applications for admission to graduate school between Fall 2021 and Fall 2022 increased by 3.9%. There were large increases in applications to Master's Colleges and Universities (18.8%) and Doctoral Universities with High Research Activities (R2) (10.4%). Applications to Doctoral Universities with Very High Research Activities (R1), and Doctoral or Professional Universities (D/PU) increased by 2.6% and 2.1%, respectively (Table C.1).

► **First-time Enrollment.** First-time enrollment fell by 4.7% overall between Fall 2021 and Fall 2022, but changes varied greatly by institution type. Specifically, there was a 6.0% decrease in first-time enrollment at Doctoral Universities with Very High Research Activities (R1), a 4.4% decrease in first-time enrollment at Doctoral Universities with High Research Activities (R2), and a 4.7% decrease in first-time enrollment at Doctoral or Professional Universities (D/PU). However, there was a 2.5% increase in first-time enrollment at Master's Colleges and Universities (Table C.4).

HIGHLIGHTS BY SELECTED DEGREE OBJECTIVES

► **Graduate-level Certificates.** Between 2020-21 and 2021-22, the number of graduate-level certificates awarded fell overall by 1.2% (Table C.25). During 2021-22, the largest proportion of certificates were awarded in the fields of health sciences (23.7%), engineering (15.0%), and education (12.2%) (Table B.22). Over the past year some institutions saw mixed growth in graduate certificates awarded, with an average annual increase of 8.1% for Doctoral Universities with High Research Activities (R2) but a 7.6% decrease for Doctoral Universities with Very High Research Activities (R1) (Table C.25). The number of graduate-level certificates awarded has grown over the last five to ten years. Between 2016-17 and 2021-22, the number of graduate-level certificates awarded increased 10.5%, and between 2011-2012 and 2021-22, the number of graduate-level certificates awarded increased 9.1% (Table C.25).

► **Master's Degrees.** Applications for admissions to master's degree or graduate-level certificate programs slightly decreased by 0.8% over the past year (Table C.3). The large majority (84.5%) of all first-time graduate students in Fall 2022 were enrolled in programs leading to a master's degree or a graduate certificate (Table B.6). The number of master's degrees awarded by institutions participating in the survey increased slightly by 0.9% between 2020-21 and 2021-22 (Table C.29).

► **Doctoral Degrees.** Applications to graduate school slightly decreased at the doctoral level (0.8%) between Fall 2021 and Fall 2022 (Table C.3). Moreover, there was a 3.2% decrease of doctoral first-time enrollment during the same period (Table C.12). The number of doctoral degrees awarded increased by 3.0% between 2020-21 and 2021-22 (Table C.30).

HIGHLIGHTS BY SELECTED STUDENT DEMOGRAPHICS

► **Underrepresented Minorities.** There were decreases in first-time enrollment among underrepresented minorities (URM) between Fall 2021 and Fall 2022. First-time graduate enrollment decreased by 1.6% among American Indian/Alaska Native students, 7.8% among Black/African American students, and 5.7% among Latinx students² (Table C.5). Total graduate enrollment also decreased among these groups. Between Fall 2021 and Fall 2022, total enrollment decreased by 1.7% among Latinx students, 4.8% among Black/African Americans, and 2.6% among American Indian/Alaskan Natives (Table C.20).

► **International Students.**³ The survey observed an increase (10.2%) in international graduate first-time enrollment between Fall 2021 and Fall 2022. The increase in international first-time enrollment was across all but one field of study, engineering, which decreased very slightly by 0.7%. Increases were largest in mathematics and computer sciences (16.6%), other fields (13.5%), biological and agricultural sciences (10.4%) and physical and earth sciences (10.3%) (Tables C.9).

► **Domestic Students.** By contrast, domestic first-time graduate enrollment declined by 4.7% between Fall 2021 and Fall 2022. Domestic enrollment declined in all fields of study with the largest decreases in engineering (16.1%), public administration and services (13.4%), business (11.3%), and health sciences (10.7%) (Table C.9). Finally, domestic first-time graduate enrollment declined more among women (5.6%) than it did for men (3.5%) between Fall 2021 and Fall 2022 (Table C.6). Despite the decrease of domestic first-time enrollment, the total graduate enrollment of domestic students only decreased by 0.6% during the same period (Table C.15).

► **Domestic Students and Projected Job Openings.** Our analysis of U.S. Bureau of Labor Statistics data for the top ten graduate degree occupations projected to have the most openings each year demonstrates that graduate schools need to produce an additional 29,000 educational, guidance, and career counselors, along with education administrators to keep up with the growing demand for professionals in these fields (Figure 10).⁴

² The term Hispanic/Latino is used as one of the citizenship and racial/ethnicity categories in the survey instrument (Appendix E). The term Latinx is used in the body of the report when referring to Hispanic/Latino population.

³ The term Temporary Residents is used as one of the citizenship and racial/ethnicity categories in the survey instrument (Appendix E). The term International Student was used in the body of the report when referring to the Temporary Resident population.

⁴ Elka Torpey, "Education level and projected openings, 2019–29," Career Outlook, U.S. Bureau of Labor Statistics, October 2020.

► **Part-time Students.** First-time enrollment of part-time graduates saw a 6.9% decrease between Fall 2021 and Fall 2022, while full-time graduate enrollment decreased by 3.7%. This is likely due to the decrease of domestic first-time enrollment and the increase of international first-time enrollment. The declines in first-time, part-time graduate enrollment were observed in the three largest fields: business (6.2%), education (11.6%), and health sciences (7.5%) (Table C.8).

► **Gender.** In Fall 2022, more than half of first-time graduate students at the master's degree and certificate level (58.0%) and at the doctoral level (56.3%) were women (Table B.7). Women constituted majorities of first-time graduate enrollment in public administration and services (79.6%), health sciences (79.5%), education (77.7%), and social and behavioral sciences (66.1%, Table B.4). Women earned most graduate certificates (66.9%), master's degrees (60.9%), and doctoral degrees (54.5%) awarded by U.S. institutions in 2020-21 (Tables B.23, B.24, and B.25).

HIGHLIGHTS BY SELECTED BROAD FIELDS OF STUDY

► **Mathematics and Computer Sciences.** This was the only field to increase in first-time enrollment (5.4%) between Fall 2021 and Fall 2022, following the positive trend over the previous five-year (12.3%) and ten-year (17.2%) period (Table C.7). Mathematics and computer sciences have the largest increase of first-time enrollment for full-time students (10.8%), for international students (16.6%), and for female students (16.6%) between Fall 2021 and Fall 2022 but one of the largest decreases for part-time students (12.1%) (Tables C.8, C.9 and C.11).

► **Engineering.** First-time enrollments in engineering decreased by 8.1% (Table C.7). The first-time, full-time enrollment in engineering decreased by 5.7% (Table C.8) and the first-time international enrollment in engineering increased by 0.7% over the past year, reflecting the overall increase in international graduate first-time enrollment (Table C.9).

► **Health Sciences.** Graduate applications in health sciences decreased by 5.6% at the doctoral level and 10.4% at the master's level (Table C.3). There have been increases in awards of master's degrees (3.6%) and graduate-level certificates (17.4%), and an increase in doctoral degrees (0.6%) in health sciences between 2020-21 and 2021-22 (Tables C.28, C.29 and C.30). Health sciences also conferred a large share of the doctoral degrees (23.7%) (Table B.22).

TABLE OF CONTENTS

Table of Contents.....	1
List of Figures	2
Introduction	3
Acknowledgments	4
Graduate Applications, Enrollment, and Degrees: Fall 2022.....	5
Graduate Applications.....	5
First-Time Graduate Enrollment	7
Graduate Certificates and Degrees.....	14
Trends in Graduate Applications, Enrollment, and Degrees: 2012 to 2022	15
Trends in First-Time Graduate Enrollment.....	17
Trends in First-time Enrollment Among Underrepresented Minority Students.....	18
Trends in First-time Enrollment by Gender and Field of Study.....	19
Trends in First-time Enrollment by Attendance Status	21
Trends in Total Graduate Enrollment	21
Trends in Degrees and Graduate Certificates.....	23
Graduate-level Certificates Awarded.....	23
Master’s Degrees Awarded.....	24
Doctoral Degrees Awarded	25

LIST OF FIGURES

Figure 1. Graduate Application Acceptance Rates by Carnegie Classification and Degree Level, Fall 2021

Figure 1.1. First-Time Graduate Enrollment by Broad Field and Gender, Fall 2022

Figure 2. First-time Graduate Enrollment by Broad Field of Study and Attendance Status, Fall 2022

Figure 2.1 Trends in Full Time Enrollment by US Citizenship or Temporary Status, Fall 2012 to Fall 2022

Figure 3. First-time Graduate Enrollment by Broad Field of Study and Citizenship, Fall 2022

Figure 4. U.S. Citizen and Permanent Resident First-time Enrollment by Race/Ethnicity, Fall 2022

Figure 5. Total Graduate Enrollment by Broad Field of Study and Degree Level, Fall 2022

Figure 6. Changes in Graduate Applications by Degree Level, Fall 2012 to Fall 2022

Figure 7. Trends in First-time Graduate Enrollment by Broad Field of Study, Fall 2012 to Fall 2022

Figure 7.1 Trends in First-time Graduate Enrollment by Broad Field of Study, Fall 2018 to Fall 2022

Figure 8. Percentage Shares in Total Graduate Enrollment of U.S. Citizens and Permanent residents by Selected Race/Ethnicity, Fall 2012 to Fall 2022

Figure 9. Trends in Graduate Degrees Awarded by Degree Level, 2012 to 2022

Figure 10. Projected Job Openings and Number of Graduate Degrees Awarded by Select Fields

INTRODUCTION

The CGS/GRE Survey of Graduate Enrollment and Degrees is jointly sponsored by the Council of Graduate Schools (CGS) and the Educational Testing Service (ETS). Conducted annually since 1986, the survey is designed to provide information about applications for admission to graduate school, graduate student enrollment, and graduate degrees and certificates conferred.

The CGS/GRE Survey of Graduate Enrollment and Degrees is the only national survey that collects data on first-time and total graduate enrollment across all fields of master's and research doctorate programs in the United States. It is also the only source of data on first-time and total graduate enrollment by degree level (master's/certificates versus research doctorate) and the only national survey that collects data on applications to graduate school by broad field of study.

The 2022 CGS/GRE Survey of Graduate Enrollment and Degrees was launched in November 2022 and sent to the U.S.-based institutions that were members of the Council of Graduate Schools or one of the four regional graduate school associations—the Conference of Southern Graduate Schools (CSGS), the Midwestern Association of Graduate Schools (MAGS), the Northeastern Association of Graduate Schools (NAGS), and the Western Association of Graduate Schools (WAGS). This year's survey was sent to a total of 762 colleges and universities, and usable responses were received from 558 institutions, for an overall response rate of 73%.

This report begins by highlighting the findings with respect to the numbers of applications received from prospective graduate students for Fall 2022, first-time and total enrollment for Fall 2022, and the number of master's and doctoral degrees and other postbaccalaureate certificates conferred during the 2021-22 academic year. Then, the report describes select one-year comparisons and five- and ten-year average annual changes along with some trend lines. Full data tables appear in Appendix B (Data Tables for Graduate Applications, First-Time Enrollment, and Total Enrollment, Fall 2021, and Degrees Conferred, 2021-22) and Appendix C (Data Tables for Trends in Graduate Applications, First-Time Enrollment, Total Enrollment, and Degrees Conferred, 2012 to 2022). Other appendices include Appendix A (Definitions), Appendix D (Taxonomy of Fields of Study), and Appendix E (Survey Instrument). The appendices are available at www.cgsnet.org.

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Special thanks to CGS President Suzanne Ortega for her insights and guidance for the project. Also, thanks to CGS colleagues Julia Kent, Kelley Karnes, and Sarah Breyfogle for their roles in supporting this project. Moreover, we are grateful to the members of the CGS Committee on Research and Information Services, for their ongoing interest in and support of the survey.

Most importantly, special thanks to the graduate deans, institutional researchers, and staff at the colleges and universities who completed the CGS/GRE Survey of Graduate Enrollment and Degrees this year.

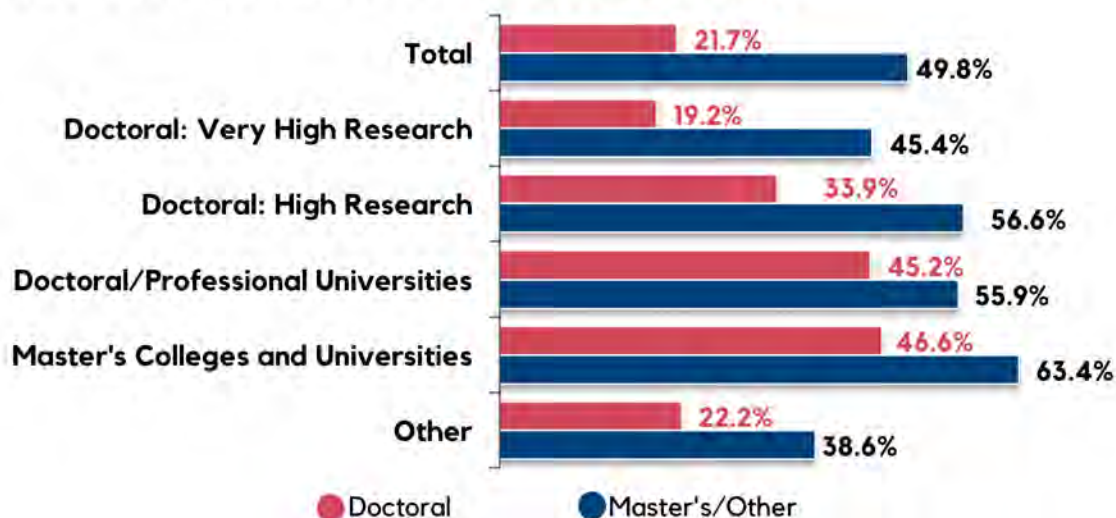
GRADUATE APPLICATIONS, ENROLLMENT, AND DEGREES: FALL 2022

This section highlights the state of graduate applications for admission for Fall 2022 by broad field and degree level. It also displays first-time and total enrollment in Fall 2022, with data presented by broad field, degree level, institution type, Carnegie Classification, attendance status, gender, race/ethnicity, and citizenship. Additionally, the numbers of graduate degrees and certificates conferred in the 2021-22 academic year are presented by broad field, degree level, and gender.

GRADUATE APPLICATIONS

Interest in pursuing graduate education remains high two years removed from the COVID-19 pandemic. Institutions responding to the 2022 GE&D Survey received more than 2.6 million applications for admission to graduate programs beginning in Fall 2022. This figure includes more than 1.5 million applications for Fall 2022 received by public institutions and just over one million graduate applications for admission to private, not-for-profit institutions. Just over 1.8 million of the applications received by institutions responding to the survey were for master's/other programs, while almost 775,000 applications were for doctoral programs (Table B.1). All of these figures slightly increased from last year's totals.

FIGURE 1. GRADUATE APPLICATION ACCEPTANCE RATES BY CARNEGIE CLASSIFICATION AND DEGREE LEVEL, FALL 2022



Source: 2022 CGS/GRE Survey of Graduate Enrollment and Degrees, Table B.1

Overall, 21.7% of doctoral applicants and 49.8% of master's/other applicants were accepted for admission. Private, not-for-profit institutions generally have lower acceptance rates than public institutions. Doctoral programs at private, not-for-profit R1 institutions were the most selective, accepting 10.9% of applications received. Master's/other programs at these universities were also more selective with an overall acceptance rate of 41.9% (Table B.1 and Figure 1).

Mathematics and computer sciences (432,115), business (287,152), engineering (272,368), and health sciences (243,813) were the broad fields of study with the largest numbers of graduate applications, accounting for 47% of all graduate applications for which the intended field of study was known (Table B.2).

At the doctoral level, the largest number of total applications for Fall 2022 were in the social and behavioral sciences (115,681), engineering (90,772), and biological and agricultural sciences (90,548). These three broad fields accounted for 38.3% of all doctoral applications for which the intended field of study was known in Fall 2022. Social and behavioral sciences had the lowest aggregated doctoral application acceptance rate (12.4%) of all broad fields, followed by arts and humanities with an acceptance rate of 16.6% (Table B.2).

For master's/other applications, the broad field of mathematics and computer sciences received the largest number of applications (362,694), followed by business (266,458). In terms of master's acceptance rates, mathematics and computer sciences (38.9%) reported the lowest aggregated application acceptance rate, followed by arts and humanities (39.9%), physical and earth sciences (46%), and biological and agricultural sciences (50%) (Table B.2).

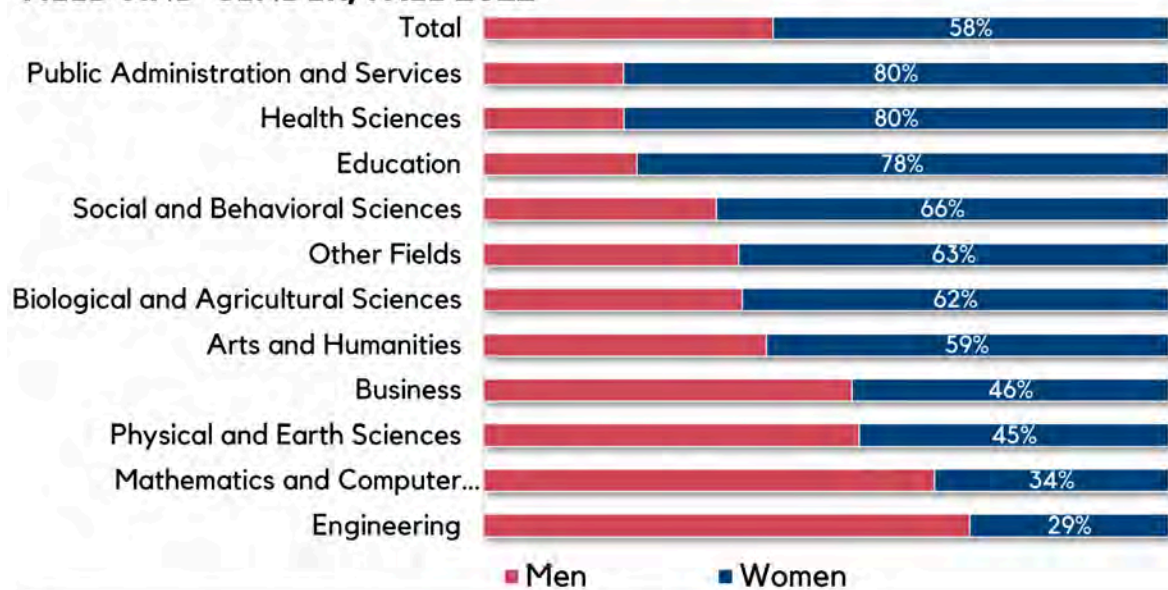


FIRST-TIME GRADUATE ENROLLMENT

A total of 508,646 graduate students enrolled for the first time in graduate certificate, education specialist, master’s, or research doctoral programs in Fall 2022 at the institutions responding to the CGS/GRE Survey of Graduate Enrollment and Degrees (Table B.3). While additional details regarding first-time graduate enrollment for Fall 2022 can be found in Tables B.3 through B.11, a few highlights are worth noting here.

Consistent with previous surveys, business (71,871), health sciences (59,799), and education (55,072) were the three largest broad fields for first-time graduate enrollment in Fall 2022. These three fields collectively represented 44.9% of first-time graduate enrollments (Table B.4).

FIGURE 1.1. FIRST-TIME GRADUATE ENROLLMENT BY BROAD FIELD AND GENDER, FALL 2022



Source: 2022 CGS/GRE Survey of Graduate Enrollment & Degrees, Table B.4

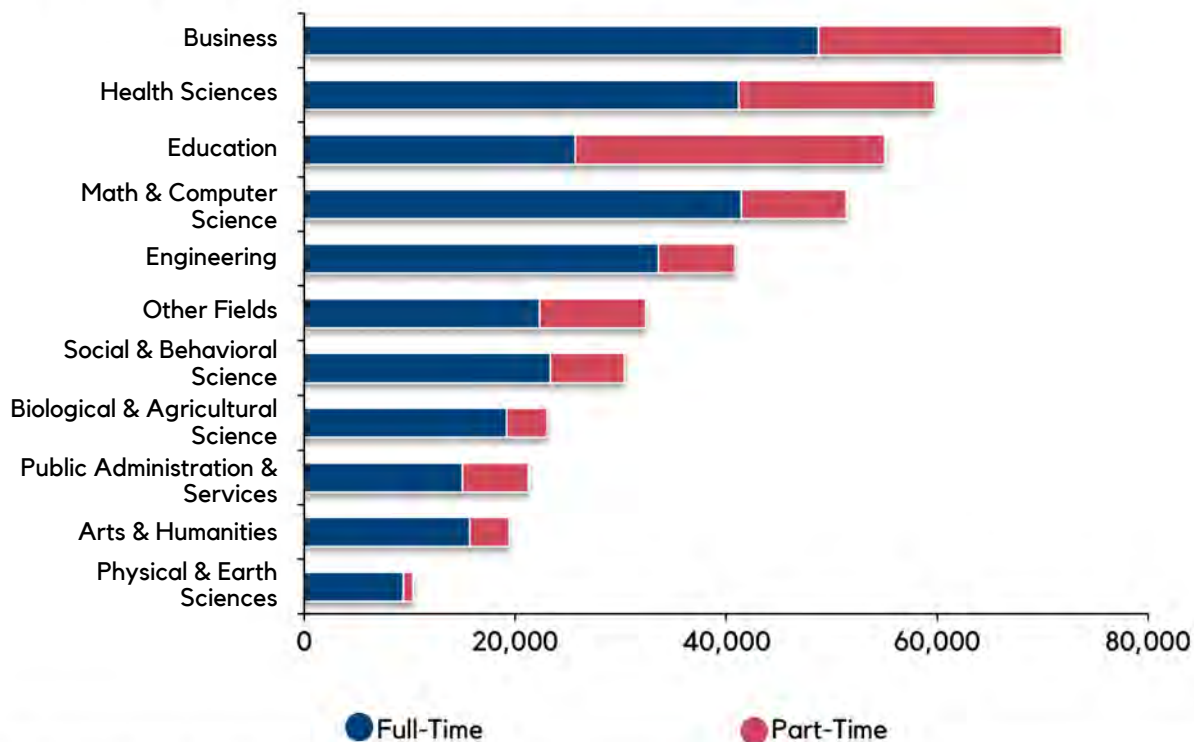
At those institutions responding to the survey, 57.8% of first-time graduate students were women, though the proportion of women varies by field of study (Table B.4). Importantly, 80% of first-time enrollees in public administration and services and in health sciences were women, compared to only 34% and 29% for mathematics and computer sciences and engineering, respectively (Figure 1.1). While women constitute more than three-quarters of first-time graduate enrollment in fields of health sciences (79.5%) public administration and services (79.6%) and education (77.7%), they comprised much smaller portions of first-time enrollment in engineering (29.0%), mathematics and computer sciences (34.2%), and physical and earth sciences (45.2%) (Table B.4).

In Fall 2022, 29.5% of first-time graduate students were part-time students (Table B.4). Among the three largest broad fields for first-time graduate enrollment, 53.4% of

education, 32.2% of business, and 31.1% of health sciences first-time enrollment were part-time students (Table B.4 and Figure 2). Overall, among first-time enrollees in Fall 2022, men were more likely to be enrolled full-time than women (74.3% and 68.7% respectively). This relationship holds for all but three broad fields: engineering, mathematics and computer sciences, and public administration and services where women were more likely to be enrolled full-time than men (Table B.5). Figure 2 below shows the number of first-time enrollees along broad fields of study:

The majority (84.5%) of first-time graduate students in Fall 2022 were enrolled in programs leading to a master’s degree or graduate certificate. In the broad fields of business (97.5%), public administration and services (96.5%), “other fields” (92.7%),¹ mathematics and computer sciences (90.5%), and education (87.5%), the shares of master’s/other enrollees were very high. By contrast, the majority (64.1%) of first-time graduate enrollment in physical and earth sciences were in doctoral programs (Table B.6).

FIGURE 2. FIRST-TIME GRADUATE ENROLLMENT BY BROAD FIELD OF STUDY AND ATTENDANCE STATUS, FALL 2022



Source: 2022 CGS/GRE Survey of Graduate Enrollment and Degrees, Table B.4

Over one-third (33.8%) of all first-time master’s/other students were enrolled in

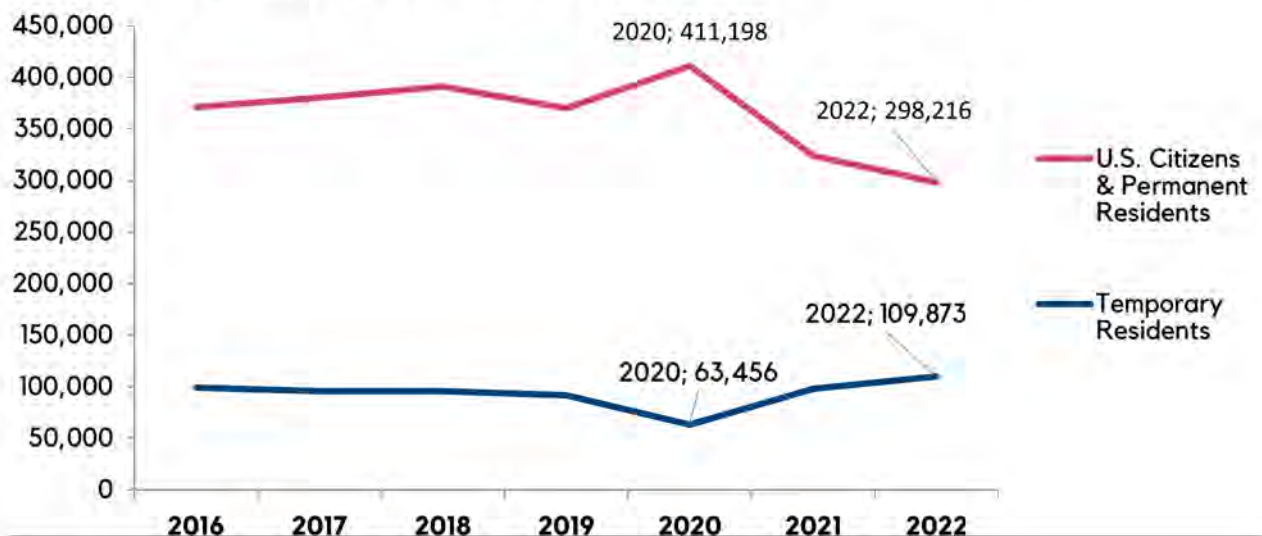
¹ The “other fields” category includes Architecture and Environmental Design, Communications and Journalism, Family and Consumer Sciences, Library and Archival Sciences, and Religion and Theology (see Appendix D).

business (70,098) and education (48,173). At the doctoral level, the broad fields of health sciences (12,894) and engineering (9,274) were the largest, accounting for about one-third (33.9%) of all first-time doctoral students (Table B.6).

In Fall 2022, women comprised a larger share of first-time enrollees than men at both the master’s and graduate certificate level (58.0%) and at the doctoral level (56.3%). Although women comprise the majority of first-time graduate students overall, they were underrepresented at the master’s and certificate level in engineering (28.2%), mathematics and computer sciences (34.8%), and business (46.1%). Moreover, men comprised a majority of doctoral first-time enrollees in engineering (68.1%), mathematics and computer sciences (70.7%), and physical and earth sciences (57.2%) (Table B.7).

Among first-time graduate enrollees in Fall 2022 for whom citizenship was known, 72.7% were U.S. citizens or permanent residents. This figure is down from 76.4% last year. Overall, there has been a slight downward trend in first-time domestic enrollment from institutions that responded to the survey, as there were more than 400,000 first-time domestic enrollments in Fall 2020 compared to the less than 300,000 in Fall 2022. First-time international enrollments instead increased over that same period, up from just under 65,000 in Fall 2020 to just over 100,000 in Fall 2022 (Figure 2.1). Domestic students comprised the largest share of first-time graduate students in public administration and services (95.5%), followed closely by education (95.2%), and health sciences (94.5%) (Table B.9).

FIGURE 2.1. TRENDS IN FULL TIME ENROLLMENT BY US CITIZENSHIP OR TEMPORARY STATUS, FALL 2016 TO FALL 2022

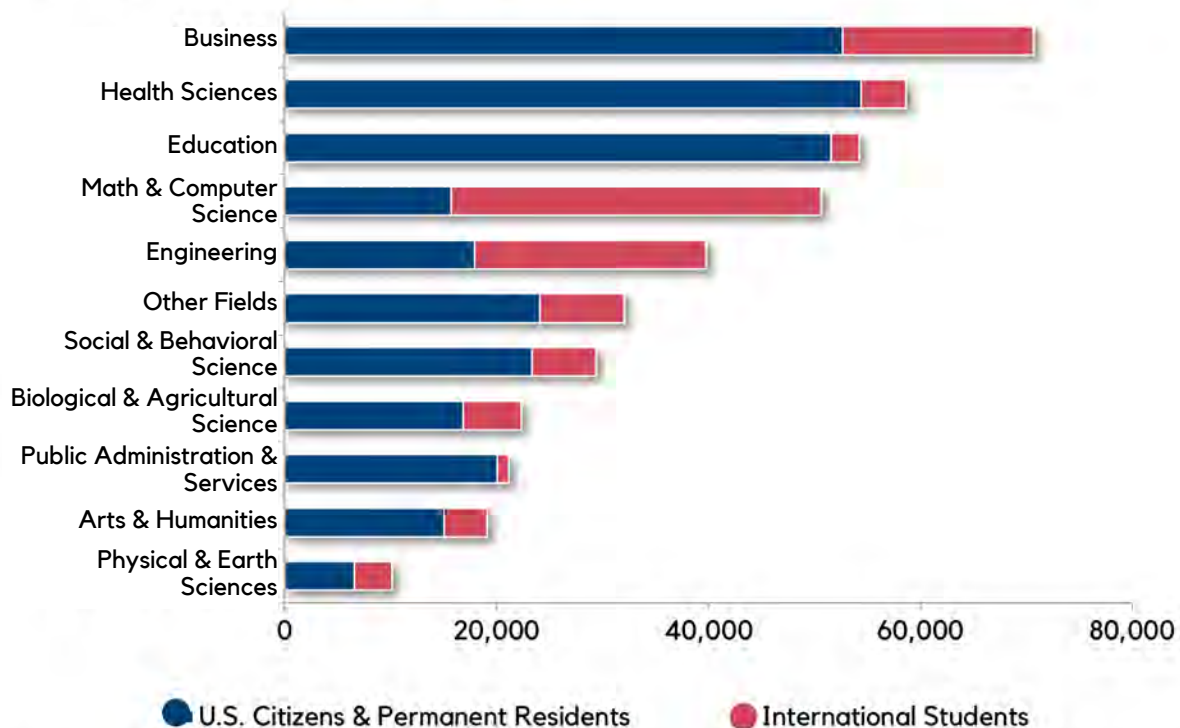


Note: Trends were developed based upon institutions that provided data for all years 2012 to 2022; therefore, the numbers of total degrees awarded do not match data in the tables.
Source: CGS/GRE Survey of Graduate Enrollment and Degrees

The share of international students among first-time graduate enrollment (35.0%) increased substantially this year, compared to the previous two years, Fall 2021 (30.4%) and Fall 2019 (12.6%).² The share of international students among first-time graduate students was higher at private, not-for-profit universities (33.2%) than at public universities (25.0%).

The share of international students among first-time graduate students was the largest at R1 institutions (34.3%) (Table B.8). International students comprised the largest share of first-time graduate students in mathematics and computer sciences (68.9%), followed by engineering (54.9%) (Table B.9 and Figure 3). Women were underrepresented among international students compared to domestic students. While 57.8% of first-time graduate enrollees who were U.S. citizens and permanent residents were women, only 43.0% of first-time graduate enrollees who were international students were women (Table B.10).

FIGURE 3. FIRST-TIME GRADUATE ENROLLMENT BY BROAD FIELD OF STUDY AND CITIZENSHIP, FALL 2022



Source: 2022 CGS/GRE Survey of Graduate Enrollment and Degrees, Table B.9

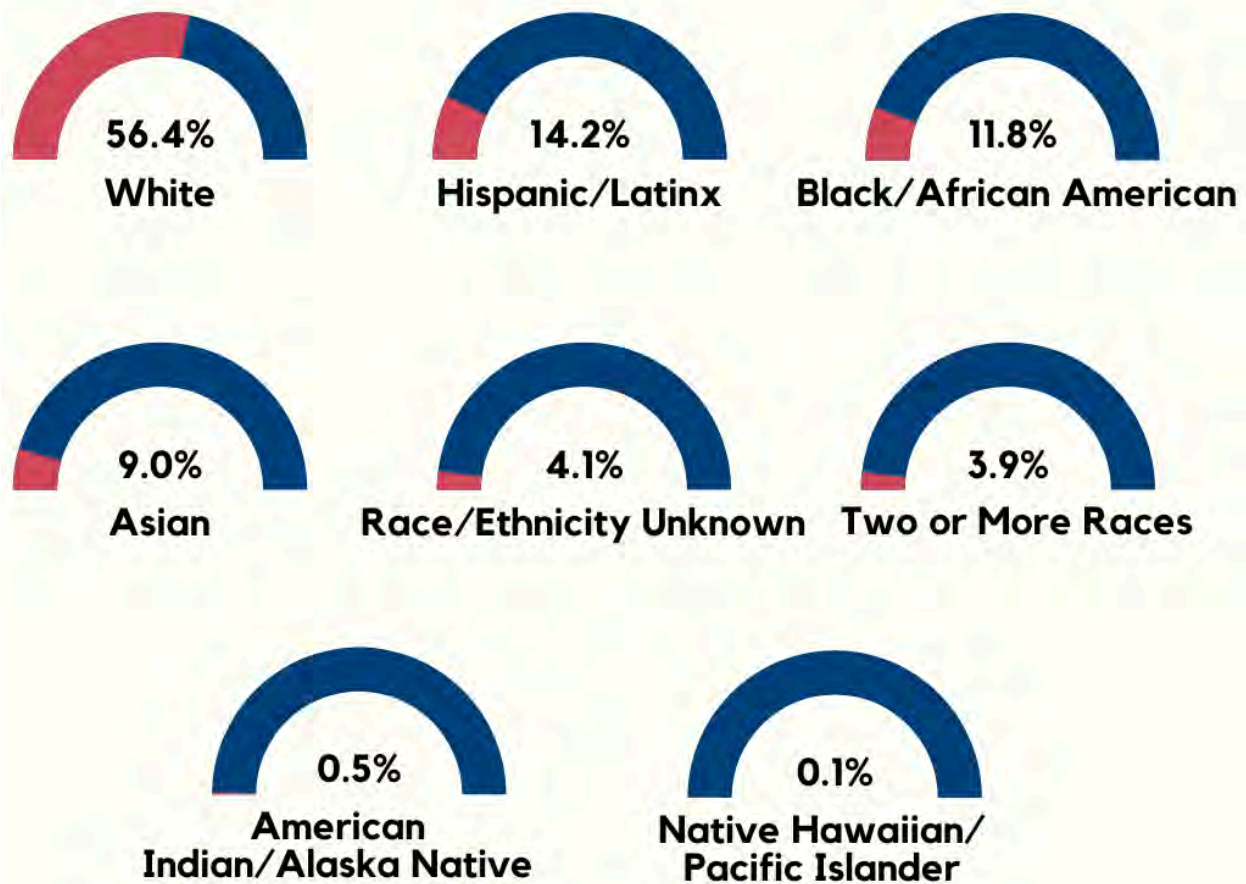
In Fall 2022, 25.9% of all first-time U.S. citizens and permanent resident enrollees were underrepresented minority (URM) students, including American Indian/Alaska

² Data for the share of first-time international enrollment in Fall 2019 and Fall 2020 can be found in previous editions of the *Graduate Enrollment and Degrees* report, which are available on the Council of Graduate Schools' website.

Native (0.5%), Black/African American (11.8%), Native Hawaiian/Other Pacific Islander (0.1%), and Latinx (14.2%). The majority of U.S. citizens and permanent residents were White (56.4%) while smaller proportions were either Asian (9.0%), race/ethnicity unknown (4.1%), or two or more races (3.9%) (Table B.11 and Figure 4).

URM students were more likely than their majority peers to enroll in some fields, such as business, education, and health sciences. In other fields, however, the representation of traditionally underserved students of color remained relatively low. American Indian/Alaska Native, Black/African American, Latinx, and Native Hawaiian/Other Pacific Islander first-time graduate students remain particularly underrepresented in science, engineering, technology, and mathematics (STEM) fields. For example, only 4.5% of U.S. citizens and permanent resident students enrolled for the first time in physical and earth sciences and 5.7% in engineering were Black/African American students. While only 4% of first-time students in education were Asian, they constituted a relatively large share of U.S. citizens and permanent residents enrolled for the first time in mathematics and computer sciences (24.4%) and engineering (17.4%) fields (Table B.11).

FIGURE 4. U.S. CITIZEN AND PERMANENT RESIDENT FIRST-TIME GRADUATE ENROLLMENT BY RACE/ETHNICITY, FALL 2022



Source: 2022 CGS/GRE Survey of Graduate Enrollment & Degrees, Table B.11

TOTAL GRADUATE ENROLLMENT

Institutions responding to the GE&D Survey enrolled more than 1.8 million graduate students in Fall 2022. While complete details of total enrollment findings by institution type, gender, attendance status, broad field, degree level, citizenship, and race/ethnicity appear in Tables B.12 to B.20 a few points are worth noting in this section.

Across all institutions, 60.5% of all graduate students were enrolled full-time while 39.5% of graduate students were enrolled part-time in Fall 2022. This was a slight increase in favor of full-time enrollments compared to last year. The share of part-time students among all graduate students was the greatest at public Doctoral or Professional Universities (D/PU) with 58.2% of graduate students enrolled part-time. Similarly, 56.1% of graduate students at public Master's Colleges and Universities were enrolled part-time in Fall 2022 (Table B.12).

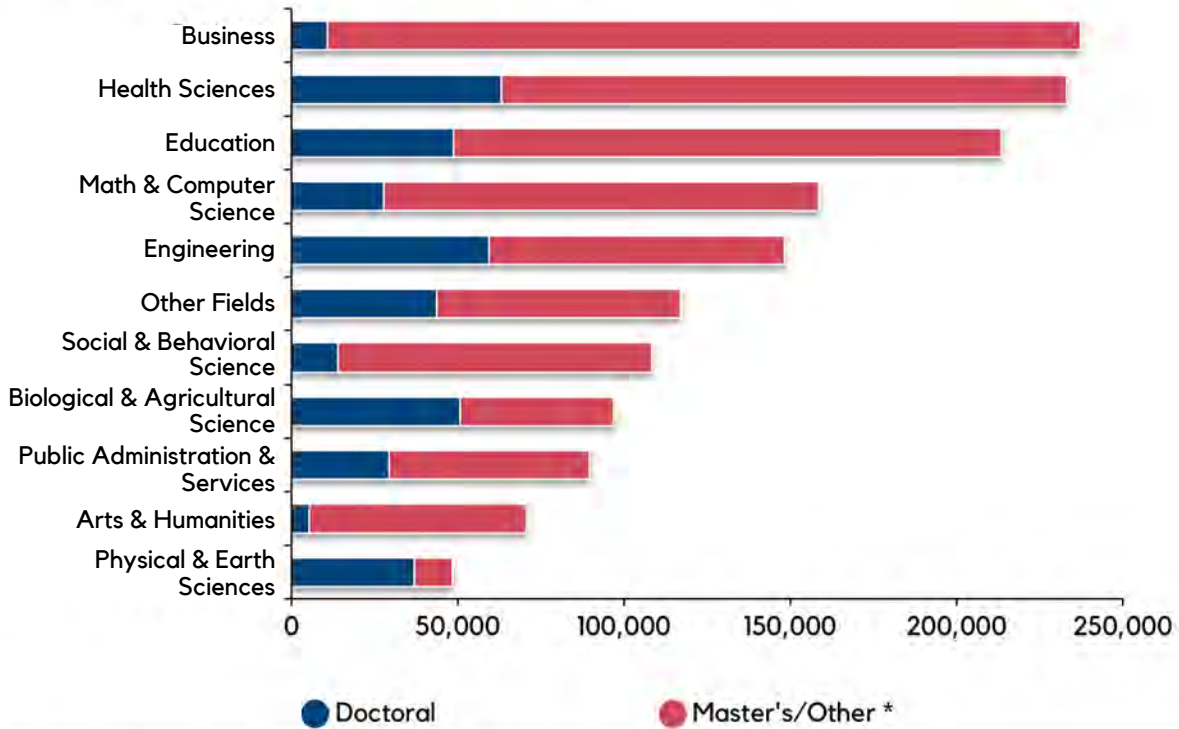
The three largest broad fields of study, – business (237,339), health sciences (234,287), and education (213,368) – were also the fields with the largest proportions of part-time graduate students. More than six out of ten (60.8%) graduate students in education, nearly one-half (45.6%) of graduate students in business, and four out of ten (41.0%) graduate students in health sciences were enrolled part-time. By contrast, physical and earth sciences (15.3%), biological and agricultural sciences (22.9%), engineering (28.5%), and social and behavioral sciences (32.4%) had smaller proportions of graduate students enrolled part-time in their programs (Table B.13).

More than one-half (58.2%) of total enrollment in Fall 2022 were women, compared to 41.8% who were men (Table B.12). Among graduate students in Fall 2022, men were more likely to be enrolled full time than women (63.8% and 58.3% respectively) (Table B.14).

Nearly three quarters (74.5%) of the total graduate enrollment at participating institutions was in master's programs, while 25.5% was in doctoral programs. Graduate enrollment in business (95.4%) and public administration and services (92.4%) was heavily concentrated in master's/other programs. Across STEM fields, too, graduate enrollment was predominantly at the master's level. However, the majority of graduate enrollment in physical and earth sciences (76.4%) and biological and agricultural sciences (52.4%) was at the doctoral level (Table B.15 and Figure 5).



FIGURE 5. TOTAL GRADUATE ENROLLMENT BY BROAD FIELD OF STUDY AND DEGREE LEVEL, FALL 2022



Source: 2022 CGS/GRE Survey of Graduate Enrollment and Degrees, Table B.15

International graduate students constituted 21.9% of total enrollment in Fall 2022, compared with U.S. citizens and permanent residents, who constituted 78.1%. This is an increase of almost 3% in the proportion of international students. At Doctoral Universities with Very High Research Activities (R1), the share of international students was 28.9% (Table B.17). The percentage of international students was particularly high in mathematics and computer sciences (59.3%), engineering (50.3%), and physical and earth sciences (34.8%) (Table B.18). Both mathematics and computer science and engineering experienced large increases compared to last year's figures.

Among U.S. citizens and permanent residents, Black/African American students were particularly underrepresented in several fields. While they constituted 11.8% of U.S. citizens and permanent resident graduate students overall, they accounted for only 3.8% of physical and earth sciences enrollees. Similarly, they were underrepresented in engineering (6.0%), biological and agricultural sciences (6.5%), and arts and humanities (7.3%) (Table B.20).

GRADUATE CERTIFICATES AND DEGREES

Institutions responding to the GE&D Survey awarded more than 675,000 graduate certificates and degrees in the academic year 2021-22 (July 1, 2021 through June 30, 2022), including 78,923 doctoral degrees, 545,649 master's degrees, and 50,553 graduate certificates (Table B.21). A few highlights are described below and full details can be found in Tables B.21 to B.25.

The large majority (80.8%) of degrees awarded in 2021-22 were master's degrees, followed by doctoral degrees (11.7%) and graduate certificates (7.5%) (Table B.21). By field of study, health sciences accounted for the largest number of doctoral degrees awarded in 2021-22, with 23.7% of the total, followed by engineering (15%), education (12.2%), and biological and agricultural sciences (11.7%) (Table B.22).

At the master's degree level, business and education programs awarded the largest numbers of degrees, accounting for 22.4% and 17.2%, respectively. Of the broad fields in this report, education (29%), business (15.4%), and health sciences (17.4%) had large shares of certificates awarded by institutions participating in this survey during 2021-22 (Table B.22).

Notably, women earned the majority of graduate degrees and certificates awarded by participating institutions in 2021-22. Women earned 66.9% of graduate certificates awarded in 2021-22, 60.9% of master's degrees, and 54.5% of doctorates. Most of the graduate degrees and certificates awarded to women were in education, health sciences, public administration and services, and social and behavioral sciences. However, in many STEM fields, men still earned most graduate degrees and certificates. Men earned about three-fourths of master's degrees (71%) and doctoral degrees (73.9%) in engineering. Similarly, 65.8% of master's degrees and 72.9% of doctoral degrees in mathematics and computer sciences were earned by men (Tables B.23, B.24, and B.25).

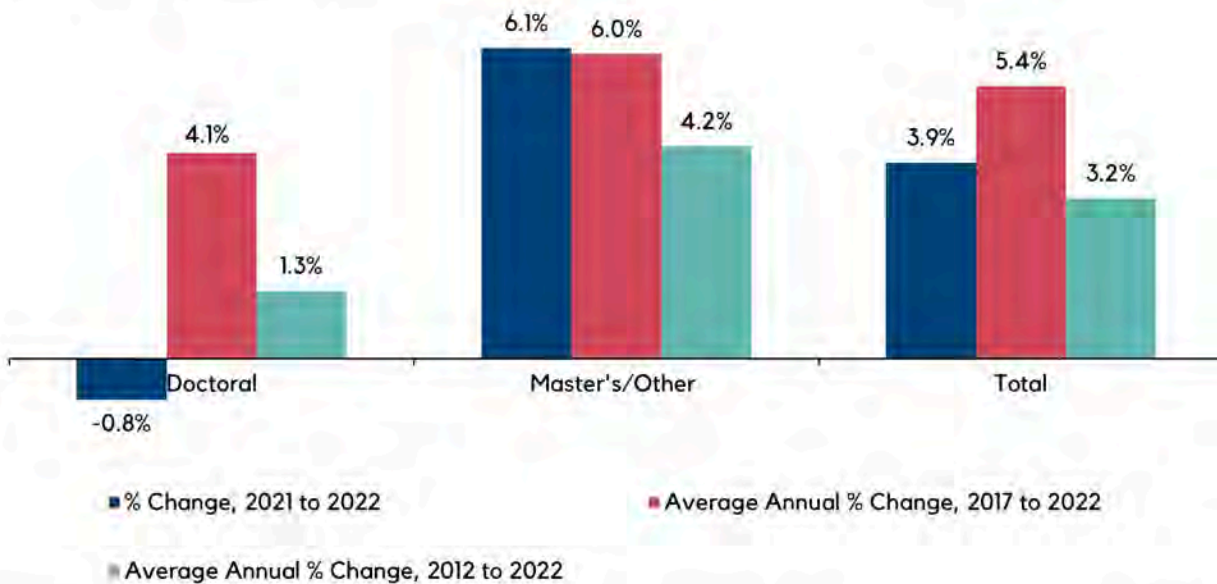


TRENDS IN GRADUATE APPLICATIONS, ENROLLMENT, AND DEGREES: 2012 TO 2022

This section presents one-year comparisons; five- and ten-year average annual changes; and selected trends in graduate applications, first-time and total enrollment, and degrees conferred from universities that reported at all periods. The findings, detailed in Tables C.1 through C.30, are presented by broad field, degree level, institution type, Carnegie Classification, attendance status, gender, race/ethnicity, and citizenship status.

Between Fall 2021 and Fall 2022, applications for admission to U.S. graduate schools increased by 3.9% at the institutions that responded to the GE&D Survey in both 2021 and 2022. Tables C.1 to C.3 offer detailed information about trends in graduate applications. Public institution application counts increased by 4.6%, and private, not-for-profit application counts increased by 2.8%. Compared to the last ten years, these figures are slightly higher, only by a few decimal points. In the decade between Fall 2012 and Fall 2022, graduate applications grew at an average annual rate of 3.2% (Table C.1).

FIGURE 6. CHANGES IN GRADUATE APPLICATIONS BY DEGREE LEVEL, FALL 2012 TO FALL 2022



Note: Master's/Other includes applications to graduate-level certificate and education specialist programs.
Source: 2022 CGS/GRE Survey of Graduate Enrollment and Degrees, Table C.1



There were some differences by Carnegie Classification. The number of applications for admission to graduate school again increased significantly at Master's Colleges and Universities (18.8%) and Doctoral/Professional Universities (D/PU) (10.4%) between Fall 2021 and Fall 2022. Very High Research Doctoral Universities (R1) and High Research Doctoral Universities (R2) only increased slightly at 2.1% and 2.6% respectively (Table C.1).

Most broad fields of study saw one-year increases in graduate applications between Fall 2021 and Fall 2022 except for observed decreases in education (7.4%), health sciences (8.9%), public administration and services (14.4%), and social and behavioral fields (6.0%). Applications for admission increased significantly for mathematics and computer sciences (26.8%), and engineering (8.7%). Although graduate applications saw an overall increase (5.4%) over the last five years, between Fall 2017 and Fall 2022, the broad field of public administration and services saw a decline of 1.3%. Compared to trends from a decade ago, institutions did better than their ten-year trends in applications for admissions in arts and humanities, engineering, mathematics and computer sciences, physical and earth sciences, and other fields. The same could not be said for biological and agricultural sciences, business, education, health sciences, public administration and services, and social and behavioral sciences (Table C.2).

Applications for admission decreased for doctoral programs (.8%) but increased for master's/other programs (6.1%) between Fall 2021 and Fall 2022. The five-year average annual rate of change was 4.1% at the doctoral level and 6% at the master's level between Fall 2017 and Fall 2022 (Figure 6). At the doctoral level, arts and humanities (12.2%) had the largest one-year increase of all broad fields of study. This was a higher rate of increase when compared to its five-year average annual rate of change (2.0%). At the master's/other level, mathematics and computer sciences (34.3%) reported the highest one-year increase, closely followed by engineering (12.9%) (Table C.3).

TRENDS IN FIRST-TIME GRADUATE ENROLLMENT

First-time graduate enrollment decreased by 4.7% between Fall 2021 and Fall 2022 at institutions that responded to both surveys. Public institutions saw a decrease in first-time enrollment (3.9%) between Fall 2021 and Fall 2022. Private, not-for-profit institutions saw a decrease in first-time enrollment (6.1%) as well. By Carnegie Classification, first-time graduate enrollment fell by 6.0% at Doctoral Universities with Very High Research Activities (R1), 5.6% at Doctoral Universities with High Research Activities (R2), and 4.7% at Doctoral or Professional Universities (D/PU) (Table C.4). Master's Colleges and Universities were the only classification to increase in this period, by 2.5% (Table C.4).

First-time international graduate student enrollment increased (10.2%) between Fall 2021 and Fall 2022. The ten-year average annual change rates for international students remained positive (7.1%), meaning that the participating institutions saw more first-time international graduate students than in Fall 2012.

First-time graduate enrollment decreased (9.6%) among U.S. citizens and permanent residents between Fall 2021 and Fall 2022. Over the past ten years, the first-time enrollment of U.S. citizens and permanent resident graduate students rose on average by 2.2% annually. First-time enrollment among White students, which constitutes the largest proportion (56.4%) of all first-time graduate enrollment in Fall 2022 declined by 11.0% between Fall 2021 and Fall 2022. This decline has affected the long-term trend for white students over the past ten years, turning it slightly negative (0.3%), between Fall 2012 and Fall 2022 (Table C.5). White total enrollment declined in all broad fields. Between Fall 2021 and Fall 2022, first-time enrollment among Asian students decreased by 8.8%, when it was the only positive race/ethnic category among U.S. citizens and permanent residents to see an increase during last year's survey (Table C.10). The smallest total decrease was among American Indian/Alaska Native students who decreased by only 1.6%.



TRENDS IN FIRST-TIME ENROLLMENT AMONG UNDERREPRESENTED MINORITY STUDENTS

Underrepresented minority students continue to drive much of the growth in first-time graduate enrollment among U.S. citizens and permanent residents over the past five-years, even with this year's figures. For example, between Fall 2017 and Fall 2022, first-time enrollment increased by 5.9% among Latinx, 1.8% among Black/African Americans, and 2% among American Indian/Alaska Natives. However, between Fall 2021 and Fall 2022, first-time enrollment decreased for all three groups. Among U.S. citizens and permanent resident graduate students, first-time enrollment fell by 5.7% among Latinx students and by 7.8% for Black/African American students. Finally, based on an already small number, American Indian/Alaska Native students saw a 1.6% decrease (Table C.5).

Among Latinx students, who constituted 14.2% of first-time domestic enrollment in Fall 2022, the 5.7% decline in first-time graduate enrollment between Fall 2021 and Fall 2022 was the result of decreases across all broad fields of study (Tables B.11 and C.10). The biggest drops were reported in engineering (15.5%) and business (11.7%) (Table C.10).

The second largest category of underrepresented minority students, Blacks/African Americans, who account for 11.8% of domestic first-time enrollment in Fall 2022 experienced an overall 7.8% decrease in first-time graduate enrollment between Fall 2021 and Fall 2022 (Tables B.11 and C.10). This also includes declines in 10 of 11 broad fields of study. First-time enrollment among Black/African American students declined in two of the three largest fields of study (20.2% in engineering and 13.1% in public administration and services) between Fall 2021 and Fall 2022, and in three of four STEM fields of study: engineering (20.2%), biological and agricultural sciences (11.4%), and mathematics and computer science (9.6%). Increases in first-time graduate enrollment among Blacks/African Americans occurred only in physical and earth sciences at 4.0% (Table C.10).

American Indians/Alaska Natives, who represent 0.5% of first-time graduate enrollment in Fall 2022, experienced an overall 1.6% decrease in first-time graduate enrollment between Fall 2021 and Fall 2022 (Tables B. 11 and C.10). Decreases were observed in all fields of study save for biological and agricultural sciences (19.0%), health sciences (0.4%), and other fields (0.6%). Large decreases in first-time graduate enrollment among American Indian/Alaska Native students were observed in physical and earth sciences (36.6%), arts and humanities (20.8%), and engineering (20.3%). These changes should be interpreted cautiously, given the small number of American Indian/Alaska Native first-time enrollees (Table C.10).

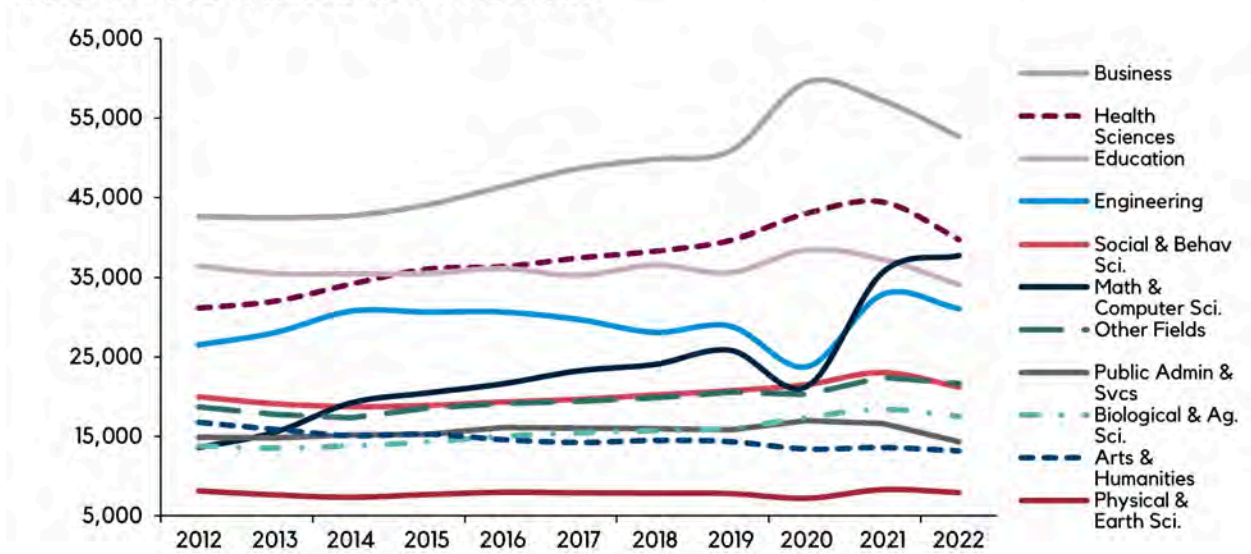
Despite the recent decreases of first-time enrollment among underrepresented minority students between 2021 and 2022, their average annual changes for first-time graduate enrollment over the past ten-year period were still positive (Table C.5). Higher education leaders should, nonetheless, recognize that declining graduate enrollments among underrepresented groups are troubling and threaten to reverse some of the modest progress that has been made in this area.

TRENDS IN FIRST-TIME ENROLLMENT BY GENDER AND FIELD OF STUDY

Both women (5.6%) and men (3.5%) saw a decrease in first-time graduate enrollment between Fall 2021 and Fall 2022. This change is driven by the substantial decrease among U.S. citizens and permanent residents; there was a 9.1% decline in first-time enrollment among women between Fall 2021 and Fall 2022, and 10.4% decline in first-time enrollment among men during the same time period (Table C.6). By comparison, among international students, first-time graduate enrollment increased by 11.0% for women and 9.5% for men and between Fall 2021 and Fall 2022.

In terms of domestic first-time enrollment patterns, decreases in the first-time enrollment of women and men were observed across all groupings by race/ethnicity between Fall 2021 and Fall 2022, except American Indians/Alaska Natives (women in that group increased by 2.2%). The decrease in first-time enrollment among Asian/Pacific Islander women (9.3%) was greater than men (8.7%) between Fall 2021 and Fall 2022. The pattern was reversed for Black/African American students (women decreased by 7.0% while men decreased by 9.8%), for Latinx students (women decreased by 5.0% while men decreased by 7.1%), and for White students (women decreased by 10.7% while men decreased by 11.6%) (Table C.6).

FIGURE 7. TRENDS IN FIRST-TIME GRADUATE ENROLLMENT BY BROAD FIELD OF STUDY, FALL 2012 TO FALL 2022



Note: Trends were developed based upon institutions that provided data for all years 2012 to 2022; therefore, the numbers of first-time enrollments do not match data in the tables.

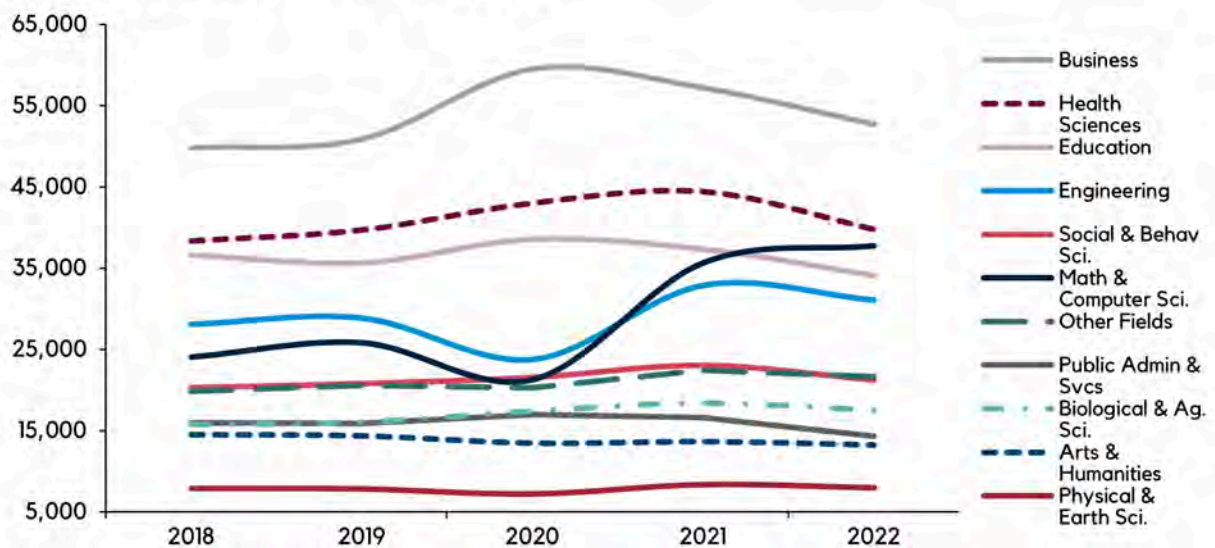
Source: CGS/GRE Survey of Graduate Enrollment and Degrees

First-time enrollment by broad fields saw across-the-board decreases as well between Fall 2021 and Fall 2022, save for mathematics and computer sciences which increased by 5.4%. All other fields fell, notably, public administration and services (12.6%), health sciences (9.4%), and education (8.8%). Over the last decade, only health sciences had growth between Fall 2012 and Fall 2022 (2.5%). Biological and agricultural sciences (4.1%) business (7.3%), engineering (8.1%), social and behavioral sciences (7.3%), and other fields (3.9%) experienced a decrease in the last year of an otherwise positive ten-year trend (Table C.7).

Although all fields saw slight declines in first-time enrollment, many fields returned to their pre-pandemic growth level (Figure 7). This effect in many ways could be interpreted as a returning to a normal and conservative growth trajectory. Take for instance business; though it experienced a peak in first-time enrollment in 2020 (57,210) and experienced two years of decrease in 2021 and 2022, the 2022 figure (52,731) is still greater than the pre-pandemic 2019 figure (50,926). Health sciences experienced a similar pattern; 39,685 in 2019, 44,416 in 2021, and then 39,765 in 2022. Figure 7.1 shows in greater detail how broad fields are returning to their pre-pandemic growth trend by looking at years Fall 2018 to Fall 2022.

For more detailed information about changes and trends in first-time graduate enrollment, see Tables C.4 through C.13.

FIGURE 7.1 TRENDS IN FIRST-TIME GRADUATE ENROLLMENT BY BROAD FIELD OF STUDY, FALL 2018 TO FALL 2022



Note: Trends were developed based upon institutions that provided data for all years 2012 to 2022; therefore, the numbers of first-time enrollments do not match data in the tables.
Source: CGS/GRE Survey of Graduate Enrollment and Degrees

TRENDS IN FIRST-TIME ENROLLMENT BY ATTENDANCE STATUS

Among first-time graduate students, full-time graduate enrollment decreased by 3.7%, while part-time graduate enrollment decreased 6.9% between Fall 2021 and Fall 2022. Only mathematics and computer sciences had growth by broad field for first-time, full-time enrollment (10.8%). All other broad fields of study between Fall 2021 and Fall 2022 decreased, with public administration (12.9%) and education (11.6%) demonstrating the largest decreases. First-time, part-time enrollment experienced declines across all broad fields of study, with the largest being engineering (18.0%), health sciences (13.2%) and mathematics and computer sciences (12.1%). Similarly, over the past decade, first-time, part-time enrollment saw healthy increases in all broad fields except arts and humanities (2.3%) and physical and earth sciences (3.2%) (Table C.8).

TRENDS IN TOTAL GRADUATE ENROLLMENT

Total graduate enrollment plateaued at 0.6% between Fall 2021 and Fall 2022 at the institutions responding to the CGS/GRE Survey of Graduate Enrollment and Degrees for both 2021 and 2022, the details of which can be seen in Tables C.14 through C.23.

Over the one-year period, between Fall 2021 and Fall 2022, total graduate enrollment increased by 0.2% at public institutions and decreased by -1.6% at private, not-for-profit institutions. Total graduate enrollment increased on average by 2.0% annually between Fall 2017 and Fall 2022 and increased on average 1.2% annually during the ten-year period between Fall 2012 and Fall 2022 (Table C.14).

Between Fall 2021 and Fall 2022, the total graduate enrollment of U.S. citizens and permanent residents decreased by 0.6%. This is a plateauing effect relative to the increases experienced by U.S. citizens and permanent residents over the last two years. Total enrollment for international graduate students continued to increase (19.5%) (Table C.15). Total enrollment increased slightly by 0.6% among men but decreased by 1.9% among women between Fall 2021 and Fall 2022 (Table C.16).

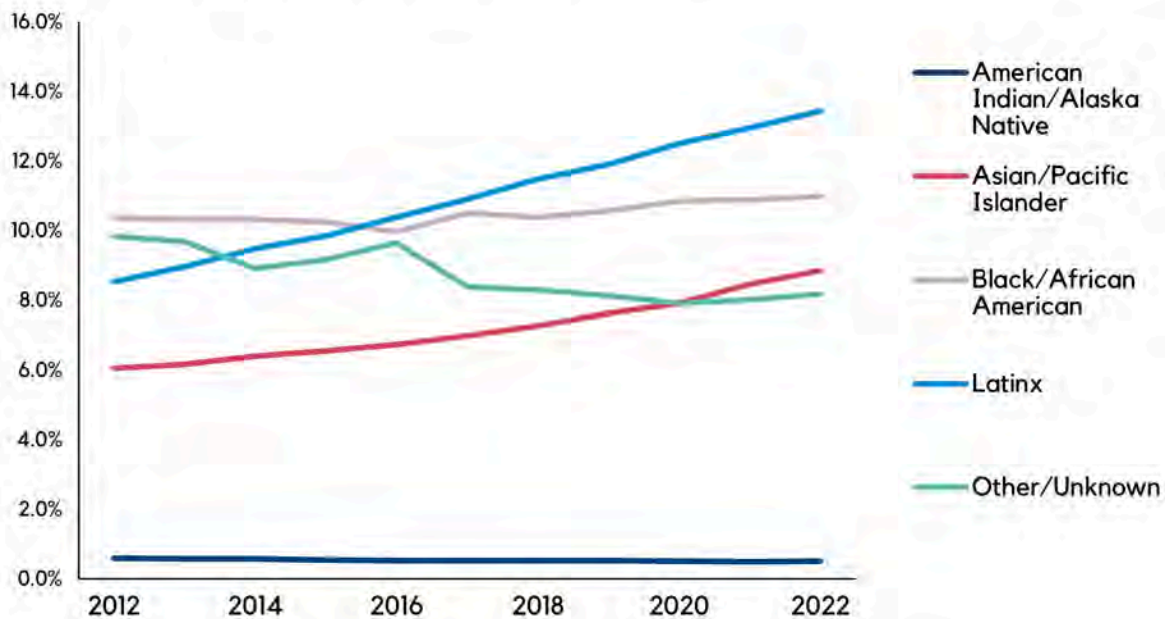
By fields of study, total graduate enrollment experienced a decrease across most broad fields over the past year except for increases in mathematics and computer sciences (18.5%), other fields (3.9%), engineering (1.8%), biological and agricultural sciences (0.9%) and physical and earth sciences (0.4%). The broad fields of study that experienced the largest decreases between Fall 2021 and Fall 2022 were education (6.9%) and public administration and services (6.6%) (Table C.17).

By attendance status, there was a 1.2% increase in total part-time graduate enrollment between Fall 2021 and Fall 2022. This was driven by mathematics and computer sciences, which experienced a large 26.1% increase over the one year. Total part-time graduate enrollment experienced the strongest gains in mathematics and computer sciences (6.4%), followed by other fields (3.3%). All other broad fields in the part-time category experienced decreases, notably, arts and humanities (8.1%) and physical and earth sciences (6.4%) (Table C.18).

Like other enrollment patterns and numbers listed above, there were across-the-board decreases of first-time graduate enrollment among underrepresented minorities. Between Fall 2021 and Fall 2022, total enrollment fell by 1.7% among Latinx students, 4.8% among Black/African Americans, 5.7% among Native Hawaiians/Other Pacific Islanders, and 2.6% among American Indian/Alaskan Natives. However, the biggest decrease of total enrollment was among white students at 7.2% between Fall 2021 and Fall 2022 (Table C.20).

Over the last ten years, while the Latinx total graduate enrollment grew on average by 6.6% annually, between Fall 2012 and Fall 2022, the total enrollment of Black/African American students grew only by 1.0% each year on average during the same period (Figure 8). The total graduate enrollment of American Indian/Alaska Native students declined on average by 1.2% annually between Fall 2012 and Fall 2022. Despite growth in the past decade, the overall share of underrepresented minorities in total graduate enrollment among U.S. citizens and permanent residents remains disproportionately low. Additionally, White students, which constitute the largest proportion of graduate students who are U.S. citizens and permanent residents, only increased 0.6% on average during the ten-year period between Fall 2012 and Fall 2022 (Table C.20).

FIGURE 8. PERCENTAGE SHARES IN TOTAL GRADUATE ENROLLMENT OF U.S. CITIZENS AND PERMANENT RESIDENTS BY SELECTED RACE/ETHNICITY, FALL 2012 TO FALL 2022



Note: Trends were developed based upon institutions that provided data for all years 2012 to 2022; the numbers of first-time enrollments do not match data in the tables.
Source: CGS/GRE Survey of Graduate Enrollment and Degrees

TRENDS IN DEGREES AND GRADUATE CERTIFICATES

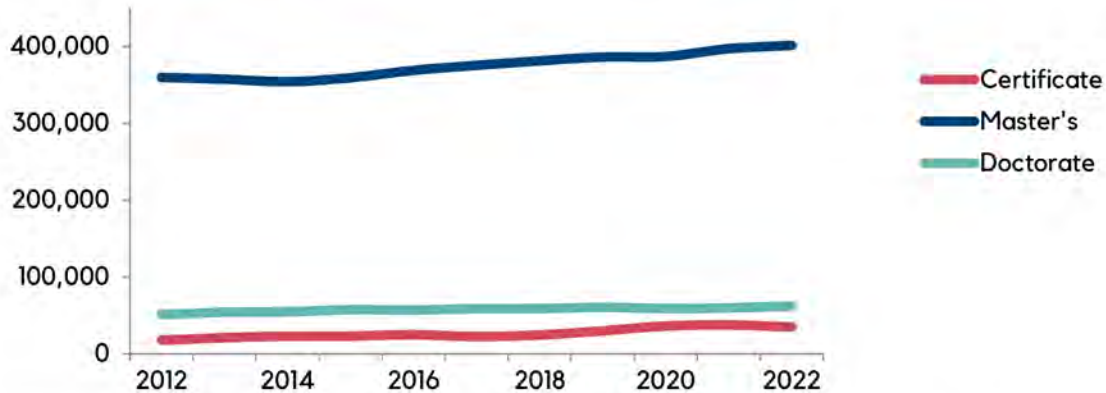
The number of doctoral degrees awarded increased by 3.0%, between 2020-21 and 2021-22 at institutions responding to the 2022 CGS/GRE Survey of Graduate Enrollment and Degrees. During the same period, the number of master's degrees awarded increased modestly by 0.9% while the number of graduate certificates awarded decreased by 1.2%. Between 2016-17 and 2021-22, increases in master's degree production (1.6%) were higher than for doctoral degree production (1.5%). Over the ten-year period between 2011-12 and 2021-22, the average annual change in the number of graduate certificates awarded was 9.1% (Table C.25). Since more master's degrees are awarded than doctoral degrees and graduate certificates, the total number of master's degrees earned continues to far exceed the number of doctoral degrees and graduate-level certificates conferred (Figure 9). Further details on changes and trends in graduate certificates and degrees awarded can be found in Tables C.24 through C.30.

GRADUATE-LEVEL CERTIFICATES AWARDED

This year marked a departure from the pattern of growth in the number of graduate certificates awarded as they fell (1.2%) between 2020-21 and 2021-22. In the five-years spanning 2016-17 to 2021-22, the average annual change in the number of graduate certificates awarded was 10.5% (compared to last year's figure of 8.0%). This year's decrease seems to be driven by two types of institutions, Doctoral: Very High Research (R1) institutions (7.6%) and institutions labelled as other (20.9%). All other institutions saw a healthy increase in the number of graduate level certificates awarded during this one year: Doctoral: High Research (R2) (8.1%), Doctoral/Professional Universities (5.0%) and Master's Colleges and Universities (8.4%) (Table C.25). It should also be noted that there are fewer graduate certificates conferred than master's or doctoral degrees.



FIGURE 9. TRENDS IN GRADUATE DEGREES AWARDED BY DEGREE LEVEL, FALL 2012 TO FALL 2022



Note: Trends were developed based upon institutions that provided data for all years 2012 to 2022; therefore, the numbers of total degrees awarded do not match data in the tables.
Source: CGS/GRE Survey of Graduate Enrollment and Degrees

By field of study, the largest increases in graduate-level certificates awarded between 2020-21 and 2021-22 were in biological and agricultural sciences (24.5%), health sciences (17.4%), social and behavioral sciences (18.7%), and physical and earth sciences (14.8%). Declines were observed in engineering (49.3%), math and computer sciences (8.3%), and public administration and services (7.9%). Over the past ten years, between 2011-12 and 2021-22, the largest on average increases in the number of graduate-level certificates were in business (26.4%), mathematics and computer sciences (17.8%), and biological and agricultural sciences (14.9%) (Table C. 28).

MASTER'S DEGREES AWARDED

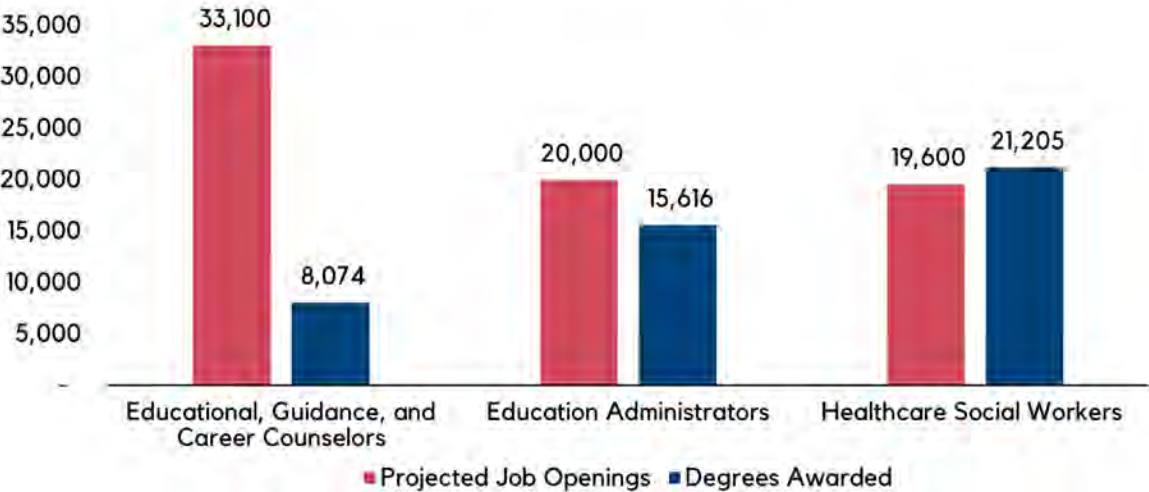
There was a 0.9% increase in master's degree production between 2020-21 and 2021-22, which was lower than the 5-year (1.6%) and 10-year (1.2%) annual average increase. The average annual percent change for master's degree production increased both at public institutions and private, not-for-profit institutions (1.6% and 0.3%, respectively) (Table C.24). The 0.9% increase in degrees awarded at the master's level between 2020-21 and 2021-22 included increases in eight broad fields of study and decreases in three others. The largest one-year increases in master's degree production were in "other fields" (7.6%), while engineering reported the largest declines in master's degree production (10.4%). The number of master's degree earned by women increased in eight of 11 broad fields of study, including business (11.3%) and physical and earth sciences (8.2%). By comparison, the number of master's degrees earned by men increased in six of 11 fields of study between 2020-21 and 2021-22 (Table C.29).

DOCTORAL DEGREES AWARDED

The number of doctoral degrees awarded increased over the past year (3.0%), and doctoral degree production grew on average 1.5% annually over the past five-year between 2016-17 and 2021-22 and on average by 2.5% annually over the ten-year period between 2011-12 and 2021-22. The larger five- and ten-year annual percentage changes of doctoral degree production were partly the result of lower base rates of doctoral degrees awarded. Over the one-year period between 2020-21 and 2021-22, doctoral degree production increased at private, not-for-profit institutions and was flat at public institutions (6.0% and 1.7%, respectively). In the decade spanning 2011-12 to 2021-22, doctoral degree production increased by 2.2% at public institutions and 3.2% at private, not-for-profit institutions (Table C.24).

At the doctoral level, between 2020-21 and 2021-22, the number of degrees awarded increased in eight broad fields, including physical and earth sciences (10.0%), mathematics and computer sciences (8.8%), and biological and agricultural sciences (7.7%). The number of doctorates earned by women increased in eight of eleven fields, the largest being in math and computer sciences (10.4%), social and behavioral sciences (10.3%), and physical and earth sciences (9.8%). The number of doctoral degrees awarded to men decreased in seven of 11 fields (Table C.30).

FIGURE 10. PROJECTED JOB OPENINGS AND NUMBER OF GRADUATE DEGREES AWARDED BY SELECT FIELDS



Source: 2022 CGS/GRE Survey of Graduate Enrollment & Degrees. Elka Torpey, "Education level and projected openings, 2019-29," Career Outlook, U.S. Bureau of Labor Statistics, October 2020.

It is important to ask how trends in the number of applications, admissions, and graduate degrees awarded impact our everyday lives. One way to explore this topic is by considering how well CGS institutions and regional affiliates are meeting the needs of the U.S. workplace. To accomplish this task, we utilize data from the U.S. Bureau of Labor Statistics (BLS) in concert with GE&D data. We compare BLS estimates of the top ten occupations projected to have the most job openings each year with the actual number of graduate degrees awarded by institutions participating in the GE&D survey. Our analysis focuses on three fast-growing careers from the top ten (educational, guidance, and career counselors – ranked #2; education administrators – ranked #5; and healthcare social workers – ranked #6) that BLS identified as requiring master's or doctoral degrees.¹ Moreover, BLS categorization schemes for these fields closely match the taxonomies utilized for the GE&D instrument.

Strikingly, Figure 10 on the preceding page shows that the combined degree production efforts of a majority of U.S. graduate schools fall short of minting around 25,000 much-needed educational, guidance and career counselors each year. Similarly, our findings suggest that another 4,000 or so graduate degree-trained education administrators are needed to meet BLS demand projections. This is an opportunity for Chancellors, Provosts, and state legislators to provide resources to meet these growing workforce needs in the near future. Furthermore, given trends in graduate applications, enrollments, and degrees awarded, the data suggests a need for investments in education career pipeline programs and degree completion initiatives. On the other hand, our GE&D measure of graduate social work degrees awarded indicates that the number of career ready professionals coming out of graduate schools is in line with the large number of job openings in the field.²

¹ Elka Torpey, "Education level and projected openings, 2019–29," Career Outlook, U.S. Bureau of Labor Statistics, October 2020.

² Our GE&D measure of Social Work includes some social workers who work in youth services or other general fields.

The CGS Graduate Enrollment and Degrees report, published annually since 1986, presents the findings of the CGS/GRE Survey of Graduate Enrollment and Degrees and is a joint project of the Council of Graduate Schools and the Graduate Record Examinations (GRE) Board. This report is the most current version of the only national survey that collects data on first-time and total graduate enrollment across all fields of master's and research doctorate programs in the United States.

