An Analysis of Recent Enrollment, Discipline and Graduation Trends Among Females and Underrepresented Minorities at SUS Institutions

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Table of Contents

Table of Tables

Table of Figures

Executive Summary

Increased numbers of minority students as well as increased numbers of Florida high school graduates entering higher education in Florida have influenced Florida SUS enrollment and graduation characteristics. This study of 510,952 undergraduate students shows that between the years, 1996 and 2003, the number of entering undergraduate students in each year increased from approximately 54,000 to more than 72,000 students during this period (Figure 1), while the percentage reporting themselves as white (Table 1) dropped from 64.4% to 59.8% (4.6% decrease). All non-white groups increased in representation at entry during this time, with increases ranging from a low of 0.3% for Asians (4.3% in 2003) to highs of 1.5% for Black (15% in 2003) and 1.9% for Hispanic students (16.3% in 2003). As Figure 2 shows, most of this growth occurred among First Time In College (FTIC) students.

Analysis of First Time in College (FTIC) cohorts in SUS factbooks from 1983-84 through 2004-05 shows a steady decline in the proportion of white students among those earning bachelors degrees. The percent of graduates was 80% or more white from 1983-1990; 70% or more white from 1991-1996; 65% or more white from 1997-2000, and this figure has dropped to 62.5% in the most recent cohort 2004-05 (Figure 4). For the most part, minority increases during this time may be attributed to Black and Hispanic students, because Asian, Other and American Indian make up about 10% of the 2004-05 population.

To summarize, enrollment and graduation trends parallel population trends, with increasing percentages of underrepresented minorities and, to a lesser extent, females in both these categories. Increases among minorities are somewhat smaller, but are consistent among graduating students. Females show a consistent advantage over males in graduation efficiencies. Different groups of interest in this study tend to gravitate toward specific disciplines, although this is less often the case among Hispanics than among either Blacks or females. The sciences and engineering continue to exhibit lower representation among Blacks and females, although both groups have been gaining ground at both entry and graduation within broad discipline areas.

Consideration of Student Type

Recent large increases in entering FTIC students have strained the SUS's capacity to serve such large cohorts, and, as a result, entry requirements have become more stringent. Unfortunately, academically comparable Blacks, Hispanics and females tend to perform at lower levels on standardized tests than white and Asian males, thereby introducing an acceptance bias against these groups (Micceri, 2001). This dampening effect is likely a factor in the comparatively stable representation among Blacks, Hispanic and Other students in FTIC cohorts (36% in 1996, 38% in 2003), and their increasing representation among Community College Transfer (CCT) cohorts (28% in 1996, 37% in 2003, see Table 4 and Figure 5). Florida community colleges require only a high school diploma for entry.

CCT students consistently graduate at higher rates than FTIC students,[1] with the smallest advantages occurring for white (3-5%) and Asians (usually 2-3%), and the greatest advantages for respectively, Other (15%+), Blacks (10%) and Hispanics (5% to 10%). Overall, Blacks and Hispanics show the lowest graduation rates among both FTIC and CCT students, with smaller gaps occurring among CCT students. This is particularly true for Other students, who are quite

[1] It is only legitimate to make comparisons up to the 1999 entry cohort, because that year's FTIC students had six (6) years in which to graduate (see the Limitations section in Methods for details).

comparable to females, whites and Asians among CCTs and more closely aligned with Blacks and Hispanics among FTIC students (Table 4).

Representation in Disciplines among Students Earning Baccalaureate Degrees

More detailed analysis of recent graduating cohorts shows that female, Hispanic and Black students tend to be overrepresented in some broad disciplines (2-digit CIP) and underrepresented in others. Hispanics are distributed more evenly than is the case for those in other groups, showing over-representation in only two disciplines (Architecture and Foreign Languages), and under-representation in only Environmental and Forestry Sciences. Generally speaking, different groups tend to gravitate to specific disciplines, with the only two overlapping areas, History (Black and Female) and Environmental and Forestry Sciences (Black and Hispanic). Among Blacks and Females there is overlap in Engineering Technology; Philosophy, Religion and Theology; and History. Black students are overrepresented in Other Social Sciences, Protective Services, Public Administration and Health Professions and Related Sciences. When females are overrepresented, they tend to virtually dominate the disciplines, making up 80% or more of all graduates. This is the case in five disciplines: Education, Human Sciences, Psychology, Public Administration and Services, and Health Professions and Related Sciences (Table 5).

Trends in Proportions of Graduating Classes[2]

Female Students

In several broad disciplines, females have shown comparatively steady growth in percentages of graduates during this eight year period (see Table 6). Growth occurred in: Architecture, Engineering, Engineering Technology, Interdisciplinary Sciences, and Physical and Related Sciences. Females show comparatively steady decreases in Computer and Information Sciences and Human Sciences.

Black Students

Blacks show fairly steady increases in most disciplines, with only two exceptions: Environmental, and Liberal/General Studies.

Hispanic Students

Hispanics also show growth in representation among graduates over time, although not to the same extent as Black students. The largest and most consistent increases have occurred in Mass Communication, Education, Biological Sciences, Mathematics and Business and Management. Among Hispanic students disciplines in which they have been traditionally over represented now show comparatively consistent declines: Architecture and Foreign Languages,

Efficiencies

To estimate changes over time within broad discipline areas, the difference between the average of the last three years and first three years in the eight-years of graduation proportions (1998 through 2005) and entry proportions (1996 through 2003) were computed separately for each discipline area. Negative percentages indicate that a given subgroup (female, Black or Hispanic) shows lower representation in the graduation class than in the corresponding entry group, and positive, a greater percentage (Table 8).

[2] When looking at these trends, comparisons are only legitimate from 2000 through 2005 because the 1998 and 1999 cohort graduations reflected predominately transfer students from the 1996 and 1997 matriculation cohorts.

From Matriculation to Graduation (Table 8):

1. Relative to their presence in the total population, females are substantially underrepresented in Engineering (35% to 40% below their standard 60%) and in Mathematics and the Physical Sciences (10% below) and overrepresented in the Biological and Health Fields (10% to 16% above).
2. Blacks show comparatively low representation in Engineering (4% to 7% below their 13% in the general population), and Hispanics in Mathematics and Physical Sciences in the first two years (5% below their 14% in the population).

From Program Entry to Graduation (Table 9):

One would expect considerably smaller differences when considering attrition/persistence from program entry to graduation because all students included were admitted to a program. For all of the following, females are equivalent or present in larger numbers than males, while there are fewer Hispanic and Black students relative to Asian and white students.

All Disciplines – Females show greater efficiencies than males, and Black student efficiencies improve from -3.0% in graduation during year 2001 to -1.2% in 2005. Hispanic efficiencies appear to be comparatively stable over this time, ranging between -1.3% and -2.1%.

Engineering – From 2001-2005, females show a consistent 3.0% advantage over males. Blacks are steady at about -2.0% and Hispanics show a small decrease from around 0.0% in 2000-01 to -2.5% in 2004 and 2005.

Math and Physical Sciences – Females show a 1.5-2.0% advantage; Blacks and Hispanics show highly variable efficiencies ranging from around zero to -5.0% (Blacks 2001-2002). Inconsistencies from year to year suggest that it is not reasonable to interpret the existence of any trends in these data.

Biological and Health Sciences – This is almost the only area where females show a negative efficiency, although it is very close to zero from 2001 through 2005. Blacks show lower efficiencies in this area. Hispanics show rates between a -1.4% and -2.0% (from 2001 through 2005).

As Table 11 shows, during stable graduation years (2000-2001 through 2003-04) although females show some decrease in graduation rates, for underrepresented minority groups, the changes are generally positive during this time, with Blacks and Hispanics exhibiting only small decreases in most disciplines. For females, substantial decreases (3% or more) occur in Mathematics, Law and Computer and Information Sciences. Increases occur in Mass Communication and Architecture. For Hispanics, only in Foreign Languages (-3.3%) and Environment and Forestry (+4.7%) did substantial increases (3% or more) occur. For Blacks, several increases of 3% or more occur including: Other Social Sciences, Environment and Forestry, Health Professions, Mathematics, Engineering Technology, Interdisciplinary Sciences, Social and Political Sciences, Business, Protective Services, Law and Foreign Languages.

Limitations

This study has several limitations as detailed in the Methods section.

Introduction

This study, of 510,952 students, attempts to determine what, if any, trends have been occurring during the past 10 years within the Florida State University System (SUS) at the broad discipline level (2-character Classification of Instructional Program [CIP] code), among specific undergraduate student groups (females, Blacks and Hispanics) who tend to be underrepresented in certain discipline areas, such as Engineering and the Physical Sciences. The analyses reported here attempt to provide a picture of how students in these groups are faring in disciplinary fields overall and especially in those areas in which the nation has a particular need, engineering, mathematics and the sciences.

Methods

Data from three primary sources (see below) were obtained for cohorts between 1996 (matriculation year) and 2005 (graduation year) in an attempt to assess trends and patterns in racial/ethnic and sexual representation at SUS institutions overall and within broad discipline areas as defined by 2-character CIP codes.

Analyses were conducted using SAS, 9.1 or 8.2; compiled data were summarized using Microsoft Excel 2003. Data sources include the following:

IPEDS Peer Analysis System (http://nces.ed.gov/ipedspas/)
SUS Retention Database and SUS Admissions Database
(http://www.fldcu.org/irm/mastfiles/default.asp)
SUS Factbooks (USF Internal Reference Library).

Definitions

Large Change – Because this research targets underrepresented minorities, a change of 3% was defined as large. For Blacks and Hispanics, this reflects between a 20% and 25% change in their 10% to 15% representation.

Efficiencies and Change Estimates - To estimate changes over time within broad discipline areas, differences between the average of the last three years and first three years in the eight-years of graduation proportions (1998 through 2005) and entry proportions (1996 through 2003) were computed separately for each discipline area Some efficiencies or change estimates use more stable years 1999-2000 through 2003-2004, or only initial two and final two, depending on the purpose and nature of the data, to provide different perspectives and less biased estimates. Negative percentages indicate that the subgroup (female, Black or Hispanic) has lower representation in the graduation class than in the corresponding entry group, and positive, greater representation. These efficiencies are a rough estimate of change designed to overcome a number of issues confounding analyses of such data:

- Three different groups of undergraduate students are included in the analysis, each of which tends to exhibit different characteristics and performance (FTIC, CCT and Other Transfers).

- Significantly different graduation rates occur at the various institutions and for the different types of students. For example, whereas the University of Florida (UF) frequently graduates 75-80% of its FTIC students, and FSU around 70%; several of the Metropolitan institutions (e.g. USF, UCF, FIU, FAU) usually graduate between 40% and 55% of those students. Whereas CCTs frequently graduate SUS-wide at or above the 70% level, and Other Transfers are close behind, FTIC students overall, tend to graduate at lower rates.

- Those FTIC students who earn degrees tend to so within approximately six years, however, many take longer. CCT and Other Transfers frequently graduate with two to four years of matriculation. Therefore, only earlier cohorts for FTIC students (1996 to 1999) will have had sufficient time to reach expected graduation rates by the last year for which data are available (2004-05). This means that earlier graduation cohorts considered (1998 and 1999) will consist primarily of transfer students, who tend to have somewhat different racial/ethnic characteristics than FTIC students. In the development of efficiencies, this can bias the earlier years results against certain groups who tend to be more prevalent in FTIC populations (particularly Black students). Table 4 provides cohort-based graduation rates by race/ethnicity separately for FTIC and CCT students, therefore eliminating this problem. However, 50% of the entry cohorts, and an even greater percentage of the graduation cohorts are transfer students Transfer students' higher graduation rates increase the proportions of these students in the graduation cohorts. Further, FTIC students make up only 40-42% of the 1996 and 1997 matriculation cohorts, and, although they make up 52% of the 2003 cohort, these students will not have graduated by 2005.

Limitations

The total sample includes 510,952 undergraduate students who matriculated between summer 1996 and spring 2003. Of these, 49% were FTIC, 35% CCT, 16% Other Transfers, 0.83% were unclassified and 0.06% were error. Unless the type of student is specified, all totals include the latter two groups.

Results

Sample

Figure 1 shows the steady growth in the number of entering undergraduate students between 1996 and 2003. During this time, the total grew from about 54,000 to over 72,000 students, and the figure shows that increases were comparatively parallel across semesters.

Figure 1

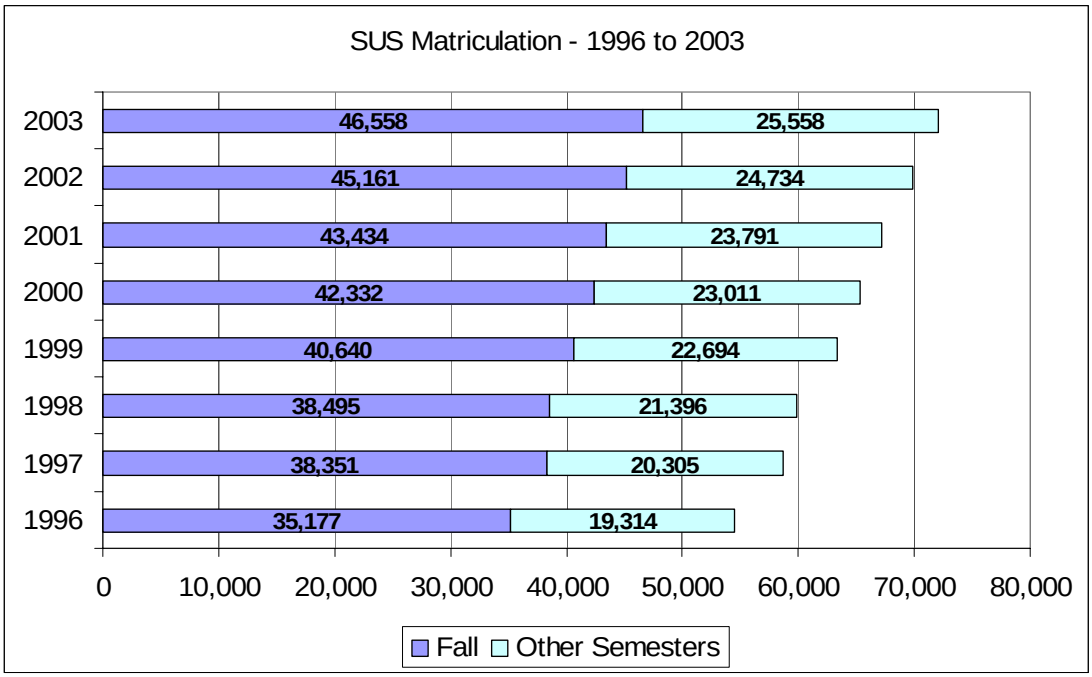


Figure 2 shows that almost all of the growth in Figure 1 occurred among FTIC students, and indicates the reason for the spread of higher entry requirements at SUS schools.

Figure 2

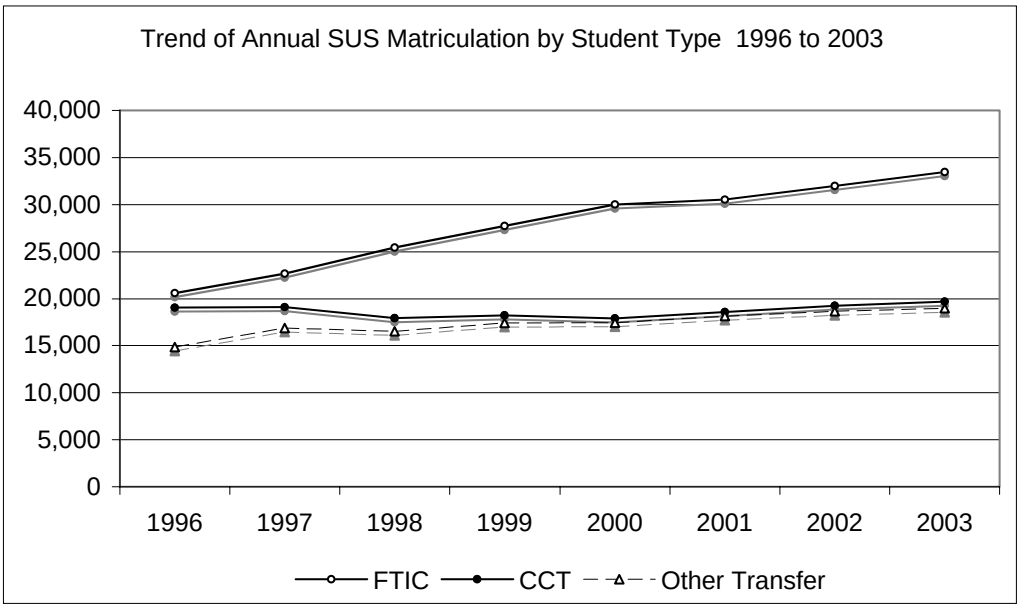


Table 1 shows all SUS entry cohorts of undergraduate students from Academic Year (AY) 1996 through 2003. Regarding race/ethnicity, a comparatively steady drop in the proportion of white students occurred over the period (4.6% decrease), with corresponding increases in proportions of Asians (+0.3%), Black (+1.5%), Hispanic (+1.9%) and Other students (+0.9%). The proportion of females increased by 1.3% during this period.

Some reduction in white representation is associated with the approximately 1% increase in the number of "Other" students. A study by Smith *et. al.* (2005) suggests these students are more likely to be white than multi-racial as had been believed. However, the Smith *et. al.* study was conducted at three small California private institutions and is probably not generalizable. Micceri (2000) found, in a multi-year study of graduate students at the University of South Florida (USF), that among students reporting race/ethnicity as Other, 92% were of non-US origins. However, graduate students apparently differ in their reported race/ethnicity from FTIC undergraduate students. An analysis of all SUS undergraduate applicants between fall 2000 and 2005 shows the percentage of "Other" from non-USA sources to range between 30% and 54%. Foreign-born students may report "Other" because they are unfamiliar with current concepts of race/ethnicity, which treat the terminating points of the 19th Century European Trade Routes as racial/ethnic groups (white=Europe, North America; Asian=Asia; Hispanic = Central, South America or Caribbean; Black = Africa; American Indian/Pacific Islander = North America or Pacific Native). In addition to the multi-racial effect, various countries define this differently, thereby causing confusion and more reported "Other[3]" races/ethnicities among foreign born students. Indeed, some reliability studies of reported race/ethnicity have shown considerable error (e.g. Abou-Sayf, 1999).

Table 1
Total Cohorts by Race/Ethnicity and Sex

	1996	1997	1998	1999	2000	2001	2002	2003
All	54,491	58,656	59,891	63,334	65,343	67,225	69,895	72,116
	Race/Ethnicity							
Asian	4.0%	4.0%	4.1%	4.2%	4.4%	4.3%	4.3%	4.3%
Black	13.5%	13.4%	14.4%	14.4%	14.8%	14.8%	14.6%	15.0%
Hispanic	14.4%	13.9%	14.1%	15.0%	14.2%	15.2%	15.8%	16.3%
Other	3.7%	3.8%	4.1%	4.5%	5.3%	5.1%	4.6%	4.6%
White	64.4%	64.7%	63.2%	61.9%	61.3%	60.6%	60.6%	59.8%
	Sex							
Female	56.4%	56.9%	57.2%	57.3%	57.7%	57.1%	57.8%	57.7%
Male	43.6%	43.1%	42.8%	42.6%	42.3%	42.9%	42.1%	42.2%

[3] Approximately half of all non-USA students selected Other as their race/ethnicity during this period.

Figure 3

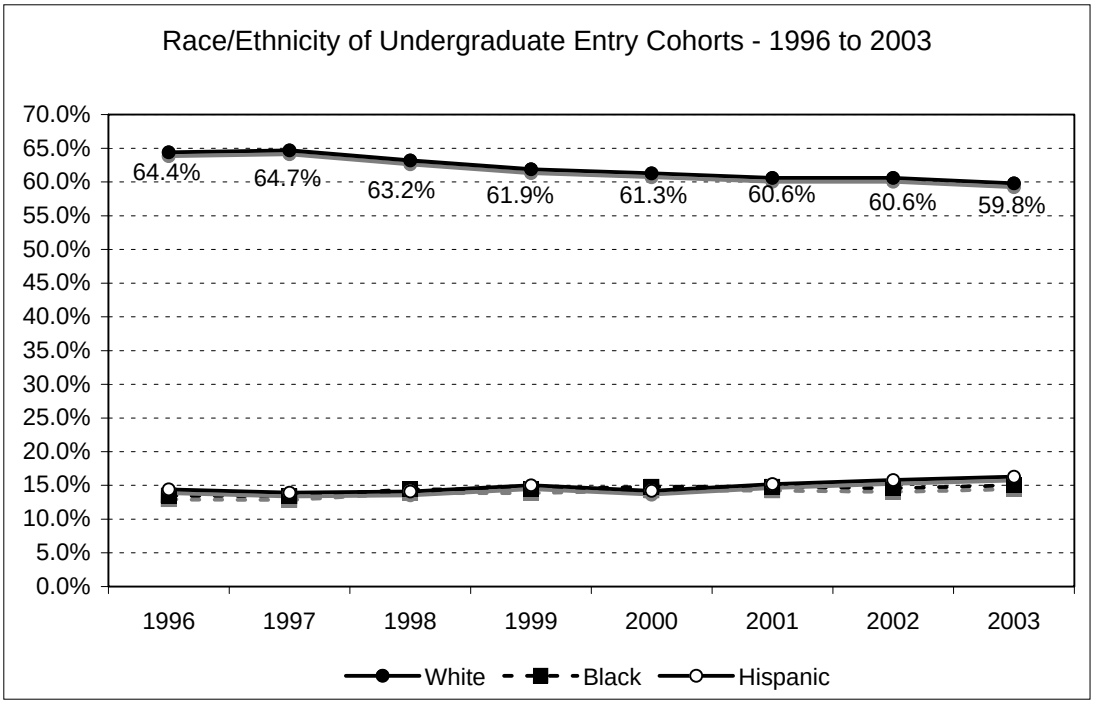
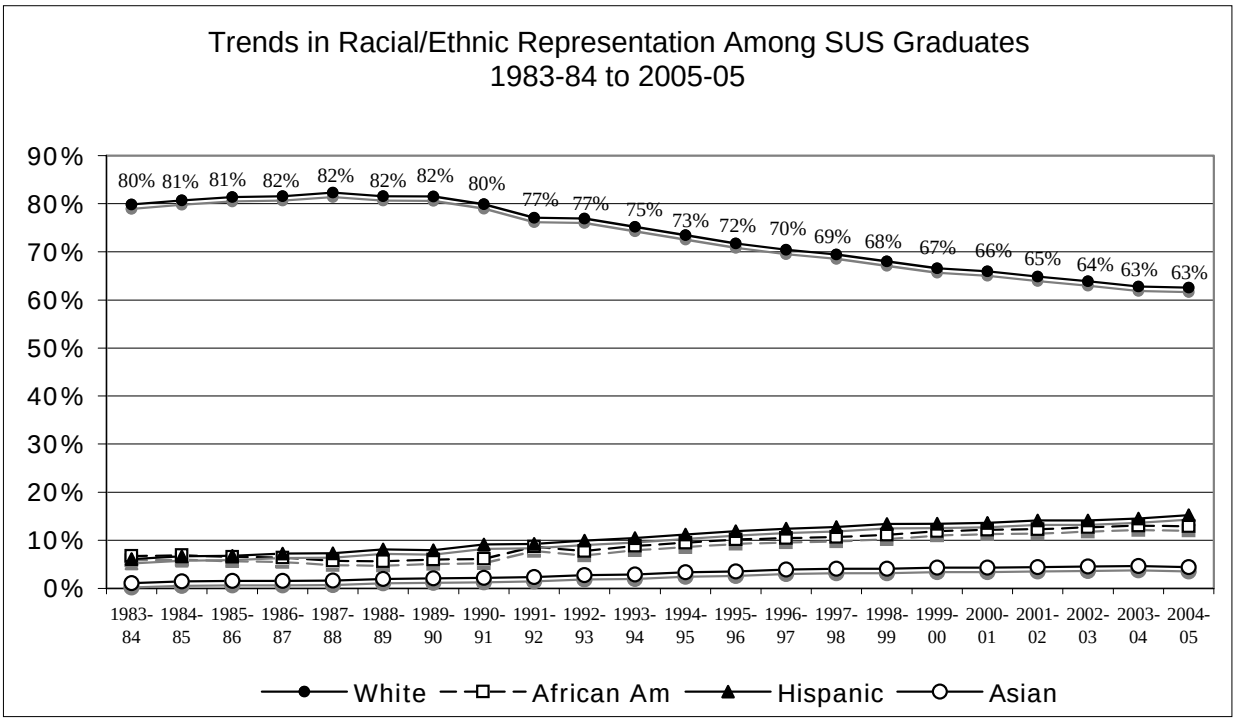


Figure 4



Comparison of FTIC and CCT Representation and Trends

The top panel Figure 5 Indicates that Black and Hispanic FTIC students have made up some 35% of the population and remained stable between 1996 and 2003, with whites decreasing by a small amount. Among CCT students, white proportions dropped during this time, with Hispanics showing the greatest increase.

Figure 5

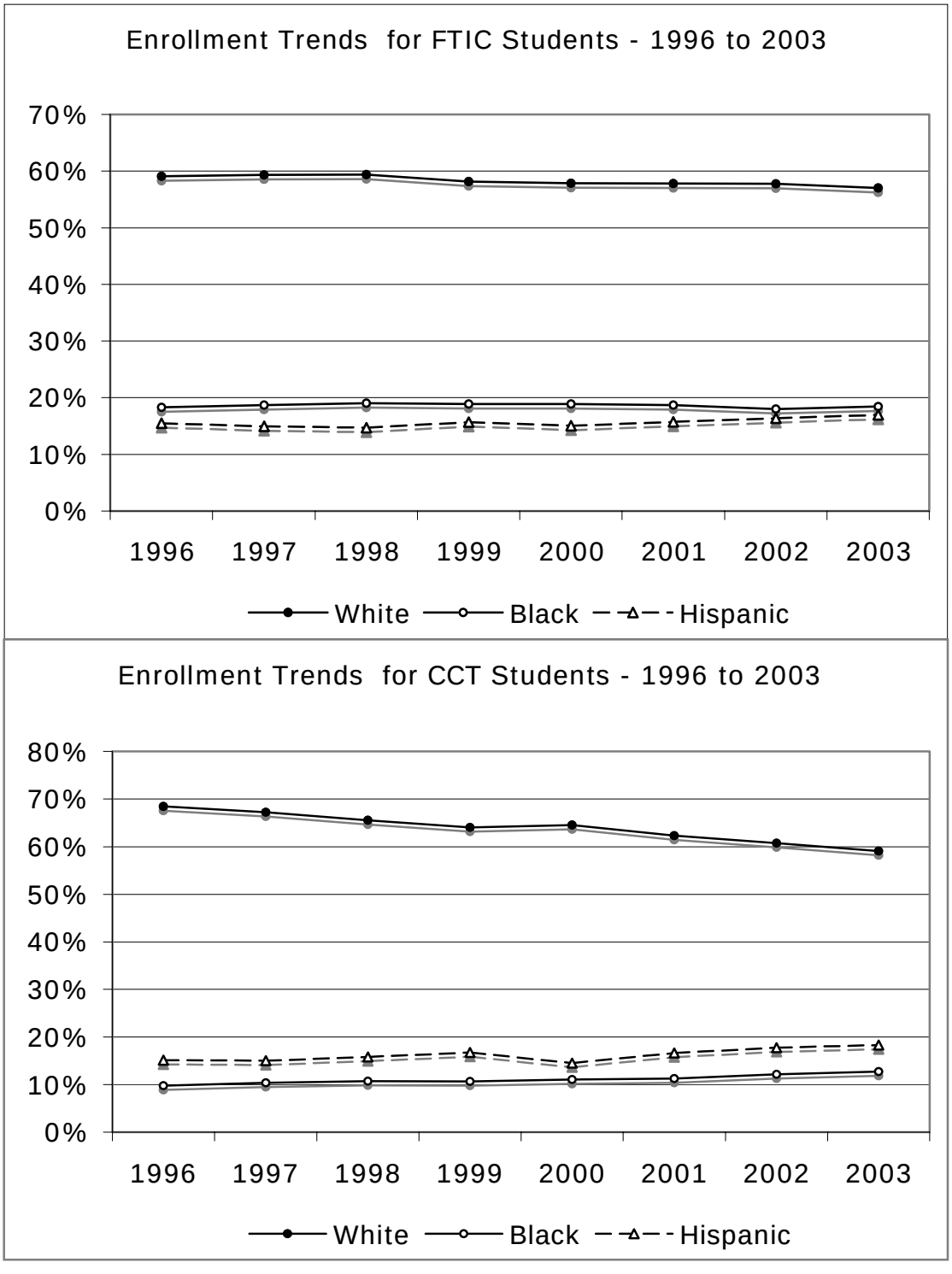


Table 2 compares FTIC and CCT representation trends in the disciplines of interest. This table suggests:

- In earlier years, CCT students had about 10% more white students than FTICs; however, this difference dropped to only 2% by 2003.
- Generally, white representation in entry cohorts has decreased, although not as much in Engineering, or Mathematical and Physical Sciences as overall, and not as much among FTICs as among CCTs.
- Black representation among FTIC cohorts remained stable, while increasing by 3% among CCT cohorts. Hispanic representation increased by respectively 1.4% and 3.2% among FTIC and CCT students.
- By the last year of this study, only Mathematical and Physical science CCTs showed 60% or more white students at discipline entry.

Table 2
Comparison of FTIC and CCT Representation in Discipline Entry Populations
1996 to 2003 Annual Cohorts

	1996	1997	1998	1999	2000	2001	2002	2003
	All Disciplines							
Female FTIC	55.9%	56.2%	56.3%	56.4%	56.8%	56.0%	57.3%	56.8%
Female CCT	56.5%	56.6%	57.7%	58.8%	58.0%	57.8%	58.0%	58.9%
Black FTIC	18.3%	18.7%	19.0%	18.9%	18.9%	18.7%	18.0%	18.4%
Black CCT	9.8%	10.4%	10.7%	10.6%	11.0%	11.3%	12.2%	12.7%
Hispanic FTIC	15.5%	14.9%	14.7%	15.7%	15.0%	15.7%	16.4%	16.9%
Hispanic CCT	15.1%	15.0%	15.8%	16.7%	14.5%	16.6%	17.7%	18.3%
White FTIC	59.1%	59.3%	59.4%	58.2%	57.8%	57.8%	57.8%	57.0%
White CCT	68.4%	67.2%	65.5%	64.0%	64.5%	62.3%	60.7%	59.1%
	Engineering							
Female FTIC	23.2%	25.3%	21.2%	20.4%	22.5%	20.2%	19.4%	18.6%
Female CCT	17.2%	17.8%	21.3%	22.2%	21.2%	20.8%	19.3%	23.0%
Black FTIC	17.5%	18.8%	18.6%	15.2%	16.8%	17.2%	15.6%	14.8%
Black CCT	10.0%	9.5%	9.1%	8.3%	10.2%	11.4%	12.9%	11.5%
Hispanic FTIC	17.0%	16.2%	14.9%	16.0%	15.1%	17.9%	18.5%	19.4%
Hispanic CCT	17.6%	16.7%	18.4%	20.4%	17.8%	18.8%	22.8%	22.7%
White FTIC	56.8%	56.7%	57.4%	60.7%	59.4%	57.0%	57.5%	58.5%
White CCT	62.7%	63.9%	62.7%	63.7%	62.6%	61.1%	56.7%	56.6%
	Mathematics and Physical Sciences							
Female FTIC	45.7%	45.7%	45.4%	42.6%	48.1%	42.7%	47.5%	46.6%
Female CCT	46.8%	43.4%	45.8%	46.1%	45.5%	44.9%	42.2%	50.4%
Black FTIC	15.8%	15.3%	18.8%	16.7%	17.5%	15.1%	14.8%	16.6%
Black CCT	13.4%	11.6%	14.6%	10.1%	13.6%	14.1%	10.2%	11.3%
Hispanic FTIC	17.0%	19.2%	11.6%	14.8%	17.5%	18.2%	16.4%	16.6%
Hispanic CCT	13.9%	16.3%	16.1%	15.7%	11.6%	11.9%	18.4%	18.5%
White FTIC	59.0%	59.3%	62.9%	62.6%	57.4%	59.8%	59.2%	58.8%
White CCT	64.1%	65.9%	62.0%	65.7%	66.7%	64.9%	67.0%	66.0%
	Biological and Health Sciences							
Female FTIC	74.6%	75.5%	76.0%	76.7%	78.3%	76.9%	77.0%	76.3%

	1996	1997	1998	1999	2000	2001	2002	2003
Female CCT	72.4%	73.7%	76.7%	80.3%	79.6%	78.5%	82.6%	82.2%
Black FTIC	24.2%	26.2%	27.1%	28.0%	28.1%	26.7%	27.3%	27.2%
Black CCT	13.2%	12.8%	13.0%	16.0%	17.4%	16.8%	19.8%	19.3%
Hispanic FTIC	13.8%	14.3%	14.0%	16.8%	14.6%	16.0%	15.6%	16.6%
Hispanic CCT	13.7%	15.7%	15.5%	16.1%	15.8%	17.3%	18.0%	19.2%
White FTIC	54.8%	52.6%	51.9%	48.7%	48.9%	49.7%	49.3%	47.8%
White CCT	67.8%	66.6%	66.7%	62.4%	62.6%	60.4%	56.2%	56.2%

Table 3 compares CCT and FTIC representation within broad disciplines at entry by showing the CCT percent of combined FTIC and CCT populations over time. The All Disciplines row shows the impact of the large growth among FTIC students during this time depicted in (Figure 2), as CCT proportions of this combined FTIC/CCT population dropped from 48% to 37%. Most disciplines showed a comparable reduction in CCT representation, except for: Public Administration and Services (from 74% to 71%), Parks and Recreation (34% to 36%), Engineering Technology (52% to 53%), Computer and Information Sciences (45% to 44%), Letters (42% to 40%) and Environmental and Forestry (55% to 53%). Some broad disciplines showed considerably greater than 11% CCT decreases, including Architecture (55% to 31%), Human Sciences (42% to 24%), Law (70% to 49%), and Interdisciplinary Sciences (39% to 9%).

Although most disciplines showed declines in their CCT proportions, some disciplines exhibited consistently higher representation of CCT students than the overall population. These include Law, Protective Services, Engineering Technology, Education and Environmental and Forestry Sciences. Disciplines exhibiting comparatively low representation are: Mass Communication, Engineering, Biological Sciences, Interdisciplinary Sciences, Physical and Related Sciences and Visual and Performing Arts.

Table 3
CCT Percentage of Combined CCT and FTIC Population Among Disciplines
1996 to 2003

	1996	1997	1998	1999	2000	2001	2002	2003
All Disciplines	48.4%	45.8%	41.3%	39.5%	37.0%	37.5%	37.3%	37.1%
Agriculture and Food Sciences	44.1%	41.8%	39.9%	41.3%	35.3%	32.1%	32.9%	39.8%
Environmental and Forestry Sciences	54.7%	60.4%	54.5%	46.3%	51.6%	51.7%	50.6%	52.9%
Architecture and Environmental Design	54.9%	47.2%	41.9%	36.4%	36.8%	34.4%	37.1%	31.3%
Other Social Sciences	46.8%	40.8%	31.9%	34.1%	20.9%	28.3%	36.7%	33.9%
Mass Communication	38.3%	35.4%	34.1%	32.2%	27.8%	27.1%	28.5%	28.3%
Computer and Information Sciences	45.2%	45.4%	42.5%	40.8%	40.4%	40.1%	43.5%	43.6%
Education	62.8%	59.8%	52.5%	51.7%	49.9%	51.0%	49.2%	51.6%
Engineering	41.0%	40.8%	34.2%	32.1%	29.1%	30.4%	27.8%	28.9%
Engineering Technology	52.3%	56.0%	54.0%	51.5%	43.4%	45.5%	48.5%	53.3%
Foreign Languages	43.1%	38.9%	34.2%	37.0%	23.7%	34.1%	25.2%	28.9%
Human Sciences	42.1%	34.4%	24.3%	28.0%	22.6%	21.2%	23.8%	24.4%
Law	71.3%	68.5%	56.7%	49.7%	47.1%	45.1%	47.6%	48.8%
Letters	41.5%	44.1%	37.6%	37.4%	39.3%	38.4%	39.7%	39.6%
Liberal/General Studies	41.0%	35.7%	32.7%	32.1%	32.3%	32.3%	31.2%	26.9%
Biological Sciences	38.6%	34.8%	34.9%	29.8%	25.5%	25.3%	23.7%	24.5%

	1996	1997	1998	1999	2000	2001	2002	2003
Mathematical Sciences	46.1%	46.0%	32.1%	32.6%	25.8%	34.7%	31.9%	37.0%
Interdisciplinary Sciences	39.3%	34.3%	22.4%	15.8%	15.1%	14.1%	11.1%	8.8%
Parks, Recreation, Leisure and Fitness	34.0%	31.7%	38.0%	38.4%	32.5%	27.2%	33.5%	36.1%
Philosophy, Religion, Theology	49.1%	36.5%	28.9%	32.7%	23.4%	30.3%	33.5%	38.6%
Physical And Related Sciences	40.3%	41.9%	34.8%	28.6%	33.1%	27.0%	25.2%	26.8%
Psychology	52.2%	50.3%	45.0%	43.2%	40.5%	39.6%	42.2%	42.7%
Protective Services	58.2%	53.9%	48.9%	47.2%	46.0%	40.4%	45.3%	43.9%
Public Administration And Services	73.8%	74.6%	68.3%	71.8%	63.9%	65.9%	65.7%	70.7%
Social And Political Sciences	45.6%	41.0%	36.9%	34.3%	32.3%	37.0%	37.5%	39.7%
Visual and Performing Arts	38.0%	35.2%	35.3%	33.0%	31.1%	32.9%	30.6%	31.9%
Health Professions & Related Sciences	53.6%	51.3%	48.1%	43.2%	39.0%	37.9%	36.8%	33.5%
Business and Management	49.4%	47.7%	43.7%	42.8%	41.6%	43.6%	43.9%	43.1%

The top section of Table 4 tells us quite clearly that there are strong differences between students enrolled in the SUS system and CCT students, although the differences have decreased somewhat during the time period under study. This may relate, at least partially, to increasingly more stringent admission standards for FTIC students at the SUS institutions during this period. The greatest changes occurred among Black students, roughly 67% of whom enrolled as FTICs during 1996. Their representation in the FTIC entry population remained virtually constant during the study, ranging between 18.0% and 19.0% of the FTIC population. However, among CCTs, Black students increased from 9.8% of the population in 1996 to 12.7% in 2003. Students reporting as Other showed a similar pattern, remaining at about 2.6-2.7% of the FTIC cohort, but increasing from 2.9% to 6.2% of the CCT cohort over time. Hispanics showed increases in both populations, with greater increases among CCTs (3.2%) than among SUS FTIC (1.4%). Thus, these three groups totaled approximately 36.4% of the 1996 FTIC cohort, and 38.0% of the 2003 cohort; while they made up only 27.8% of the CCT cohort in 1996, by 2003 their numbers had increased to 37.2% (see also Figure 5). In c0ntrast, white students showed only a 2% decrease among FTIC students, but a 9.3% decrease among CCT transfers. Females remained relatively stable in both populations with a 0.9% increase among FTIC students and a 2.4% increase among CCT students.

The lower section of Table 4 shows graduation rates from cohort to cohort by race/ethnicity and for females. Note that the final year for which data were available (2004-05) substantially limits the amount of time later cohorts have to graduate, and this is particularly true for FTIC cohorts from 2001 through 2003. CCT students consistently graduate at higher rates than FTIC students,[4] with the smallest advantages occurring for white (3-5%) and Asian students (usually 2-3%), and the greatest advantages, for respectively, Other (15%+), Black (10%) and Hispanic students (5% to 10%). Overall, Blacks, Hispanics and Other students show the lowest graduation rates among both FTIC and CCT students, with smaller gaps within a group occurring among CCT students than for FTIC students. This is particularly true for Other students, who are comparable to females, whites and Asians among CCTs while being more closely aligned with Blacks and Hispanics among FTIC students. Females consistently exhibit among the highest graduation rates for both FTIC and CCT populations.

[4] It is only legitimate to make comparisons up to the 1999 entry cohort, because that year's FTIC students had six (6) years in which to graduate.

Table 4
Comparison of Total Racial Ethnic Representation and Graduation Rates for 1996 through 2003 FTIC and CCT cohorts

	1996	1997	1998	1999	2000	2001	2002	2003
Representation in the Total Population								
	FTIC							
All	20,599	22,684	25,446	27,724	30,032	30,533	31,977	33,460
Female	55.9%	56.2%	56.3%	56.4%	56.8%	56.0%	57.3%	56.8%
Asian	4.5%	4.6%	4.6%	4.5%	5.0%	4.9%	5.2%	4.9%
Black	18.3%	18.7%	19.0%	18.9%	18.9%	18.7%	18.0%	18.4%
Hispanic	15.5%	14.9%	14.7%	15.7%	15.0%	15.7%	16.4%	16.9%
Other	2.6%	2.5%	2.3%	2.8%	3.2%	2.9%	2.7%	2.7%
White	59.1%	59.3%	59.4%	58.2%	57.8%	57.8%	57.8%	57.0%
	CCT							
All	19,043	19,099	17,922	18,198	17,886	18,552	19,263	19,693
Female	56.5%	56.6%	57.7%	58.8%	58.0%	57.8%	58.0%	58.9%
Asian	3.7%	3.8%	3.7%	3.8%	4.0%	3.8%	3.7%	3.7%
Black	9.8%	10.4%	10.7%	10.6%	11.0%	11.3%	12.2%	12.7%
Hispanic	15.1%	15.0%	15.8%	16.7%	14.5%	16.6%	17.7%	18.3%
Other	2.9%	3.6%	4.3%	4.8%	5.9%	6.0%	5.7%	6.2%
White	68.4%	67.2%	65.5%	64.0%	64.5%	62.3%	60.7%	59.1%
Cohort Graduation Rates								
	FTIC							
All	67%	66%	64%	61%	55%	33%	3%	0%
Female	70%	70%	68%	66%	60%	39%	4%	0%
Asian	67%	74%	72%	66%	57%	32%	3%	0%
Black	58%	56%	54%	50%	43%	22%	2%	0%
Hispanic	63%	60%	58%	56%	48%	30%	3%	0%
Other	53%	56%	53%	53%	51%	29%	3%	0%
White	71%	71%	69%	66%	60%	38%	3%	0%
	CCT							
All	73%	72%	71%	70%	69%	64%	51%	22%
Female	75%	74%	73%	72%	70%	66%	54%	24%
Asian	76%	75%	70%	68%	71%	65%	49%	22%
Black	68%	65%	64%	64%	62%	56%	43%	18%
Hispanic	68%	68%	68%	66%	65%	59%	44%	19%
Other	78%	73%	72%	74%	72%	69%	56%	24%
White	74%	73%	73%	73%	70%	66%	55%	24%

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Analysis of Total Undergraduate Cohort Graduation Trends

The following three tables (Tables 5, 6 and 7) show:

- Broad discipline areas that consistently have considerably higher or lower percentages of female, Black and Hispanic students than their overall matriculation or program entry percentages.
- The percent of students earning baccalaureate degrees in a given year (spring, summer and fall semester) from 1998 through 2005.
- The percent of students who were admitted to a specific broad 2-character CIP discipline from 1996 through 2003.

These data derive from the 1996 through 2003 SUS annual retention cohorts (matriculation cohorts) and therefore do not reflect the complete graduating classes of students for a given year; although in from 2000 onwards these should be reasonably close. The major factor to consider regarding these results is:

- The nature of graduates fluctuates relative to race/ethnicity because, in early graduation years (e.g. 1998-1999) only one or two cohorts of community college or other transfers from the 1996-97 cohorts have graduated. During middle to end years (2000 to 2005), FTIC cohorts from four to six years earlier contribute more to the graduation percentages, which makes those years a reasonably accurate representation of all student types. It should be noted; however, that a small percentage of SUS graduates obtain their degrees more than 10 years after their matriculation, so these percentages will not perfectly reflect all graduation proportions found in other reports because they only consider students in the 1996 through 2003 matriculation cohorts (Table 4 shows FTIC and CCT entry cohort graduation rates).

Table 5, when compared with Table 1, shows that while females make up approximately 58% of matriculation cohorts, and comprise more than 60% of graduating cohorts for all years considered here. This reflects a consistent advantage over males at navigating the higher education success pathway, as is attested by many national retention studies. Both minority groups of interest, Blacks and Hispanics, are represented in the all discipline graduating cohorts by 1-2% fewer students than in the matriculation cohorts, thus exhibiting slightly lower graduation rates than white and Asian students (see also Table 4). High and low representation in comparison of graduating versus matriculation percentages was defined using the following criteria:

- Females: about 15% above or below the standard 60%.
- Underrepresented minorities, about 10% above or below the standard 25%.
- Black students, about 5% above or below the standard 12%.
- Hispanic students about 5% above or below the standard 14%

Overall, Hispanics tend to be more evenly distributed than the other two groups, having only one under represented (low) discipline (Environmental Sciences), and two overrepresented (high) disciplines (Architecture and Foreign Languages). Respectively, females showed seven low and five high disciplines, and Blacks, five low and four high.

Low Disciplines

Different subgroups tend to be underrepresented in different broad discipline areas. The only shared areas are Environmental and Forestry Science (Black and Hispanic), Engineering Technology, Philosophy, Religion and Theology, and History (Black and Female).

High Disciplines

Females and Blacks share two disciplines (Public Administration and Sciences, and Health Professions and Related Sciences). Females and Hispanics share none. Where females are high, they tend to almost completely dominate the disciplines, making up usually 80% or more of all graduates. This is true in all five disciplines where females were high: Education, Human Sciences, Psychology, Public Administration and Services, and Health Professions and Related Sciences.

Table 5

Broad Disciplines with High or Low Proportions of Graduates by Race/Ethnicity and Sex During Annual Years 1998 to 2005 that Initially Enrolled During Matriculation Cohorts 1996 through 2003 at SUS Institutions

	1998	1999	2000	2001	2002	2003	2004	2005
Total N of Students	11,113	18,482	28,991	34,406	38,627	41,382	44,191	30,472
	Percent Female							
All Disciplines	61.6%	60.9%	61.1%	60.4%	60.2%	60.1%	60.1%	60.5%
	Broad Disciplines with Low Female Proportions (<45% throughout)							
Architecture and Environmental Design	12.5%	26.3%	27.9%	32.4%	33.3%	42.1%	41.3%	43.7%
Computer and Information Sciences	28.0%	32.1%	28.3%	29.2%	27.4%	27.1%	22.7%	22.5%
Engineering	15.9%	19.2%	22.1%	23.3%	24.2%	21.4%	20.8%	23.3%
Engineering Technology	4.7%	6.8%	9.6%	11.7%	10.8%	17.0%	7.4%	13.5%
Philosophy, Religion, Theology	36.4%	45.3%	32.6%	45.7%	43.4%	46.1%	34.9%	35.0%
Physical And Related Sciences	39.3%	41.5%	41.6%	46.4%	43.0%	44.0%	45.8%	45.5%
History*						39.7%	36.3%	39.1%
	Broad Disciplines with High Female Proportions (> 75% throughout)							
Education	80.4%	81.5%	83.8%	83.3%	84.3%	83.2%	84.1%	86.3%
Human Sciences	86.0%	83.3%	84.7%	85.9%	82.4%	81.5%	82.8%	81.4%
Psychology	77.5%	79.8%	80.4%	77.8%	80.5%	78.8%	80.4%	80.0%

	1998	1999	2000	2001	2002	2003	2004	2005
Total N of Students	11,113	18,482	28,991	34,406	38,627	41,382	44,191	30,472
Public Administration and Services	81.4%	79.5%	82.6%	84.2%	83.8%	85.3%	85.5%	83.8%
Health Professions & Related Sciences	79.1%	81.0%	83.6%	85.2%	84.9%	86.5%	86.9%	86.8%
	Percent Underrepresented Minority (Black and Hispanic)							
All Disciplines	19.3%	20.9%	22.6%	24.9%	25.9%	26.9%	27.1%	27.8%
	Broad Disciplines with Low Underrepresented Minority Proportions (< 20%)							
Agriculture and Food Sciences	17.6%	13.0%	13.2%	17.8%	20.3%	19.8%	19.8%	22.1%
Environmental and Forestry Sciences	6.2%	7.6%	9.2%	10.5%	16.3%	21.7%	17.1%	9.9%
Engineering Technology	14.1%	13.5%	11.2%	23.3%	26.2%	22.0%	23.5%	19.4%
Liberal/General Studies	14.5%	18.0%	19.9%	18.8%	18.3%	18.9%	19.7%	17.0%
History*						16.3%	14.4%	17.6%
	Broad Disciplines with High Underrepresented Minority Proportions (> 35%)							
Architecture and Environmental Design	56.3%	35.5%	37.7%	35.3%	27.9%	39.3%	34.5%	32.4%
Other Social Sciences	23.1%	33.3%	23.1%	31.4%	42.6%	39.3%	40.3%	48.2%
Foreign Languages	44.7%	42.9%	33.3%	40.3%	31.7%	40.4%	35.5%	31.1%
Public Administration and Services	40.0%	40.5%	42.6%	44.3%	45.4%	45.7%	43.3%	44.6%
	Percent Black							
All Disciplines	8.1%	8.4%	10.0%	11.3%	12.2%	12.8%	12.9%	13.1%
	Broad Disciplines with Low Black Proportions (Circa 5-6%)							
Environmental and Forestry Sciences	1.2%	3.8%	3.1%	1.5%	5.4%	8.0%	6.2%	2.3%
Liberal/General Studies	5.7%	8.0%	7.3%	8.1%	7.9%	6.5%	7.7%	6.1%
Philosophy, Religion, Theology	4.5%	4.0%	5.4%	4.7%	10.4%	7.8%	7.3%	6.7%
History*						4.1%	6.3%	6.8%
	Broad Disciplines with High Black Proportions (Circa 20% or more)							
Other Social Sciences	7.7%	16.7%	12.8%	22.9%	31.1%	37.5%	26.9%	30.4%
Protective Services	14.0%	15.4%	18.1%	18.6%	19.4%	23.2%	22.6%	21.3%
Public Administration and Services	23.5%	23.9%	27.9%	26.8%	28.8%	31.4%	28.7%	29.9%
Health Professions & Related Sciences	12.4%	13.9%	14.7%	18.5%	21.4%	22.2%	23.8%	21.0%
	Percent Hispanic							
All Disciplines	11.2%	12.5%	12.6%	13.6%	13.7%	14.0%	14.2%	14.7%
	Broad Disciplines with Low Hispanic Proportions (Circa 6-9%t							
Environmental and Forestry Sciences	4.9%	3.8%	6.1%	9.0%	10.9%	13.7%	10.9%	7.6%

	1998	1999	2000	2001	2002	2003	2004	2005
Total N of Students	11,113	18,482	28,991	34,406	38,627	41,382	44,191	30,472
	Broad Disciplines with High Hispanic Proportions (20% or more)							
Architecture and Environmental Design	56.3%	31.6%	27.9%	25.4%	21.5%	29.0%	22.6%	21.2%
Foreign Languages	35.5%	29.5%	29.4%	28.0%	23.4%	28.4%	22.4%	20.8%

* A separate History CIP occurred during 2003, in prior years, History was part of Social Sciences.

Graduation Trends over Time for All Broad Disciplines among Selected Groups

Female Students

In several broad disciplines, females have shown comparatively steady growth in their percentage of graduates during this eight year period. This occurred in: Architecture, Engineering, Engineering Technology, Interdisciplinary Sciences and Physical and Related Sciences. Females showed comparatively steady decreases in Computer and Information Sciences and Human Sciences during the time period under study.

Black Students

Blacks have shown fairly steady increases in most disciplines, with only two exceptions: Environmental, and Liberal/General Studies.

Hispanic Students

Hispanics have also tended to show growth in representation among graduates over time, although not usually to the same extent as Black students. Their greatest and most consistent increases appear to have occurred in Mass Communication, Education, Biological Sciences, Mathematics and Business and Management. Hispanic students also show two disciplines with comparatively consistent declines: Architecture and Foreign Languages, possibly due to their larger representation in those disciplines.

Table 6

Percent of Graduates by Race/Ethnicity and Sex During Annual Years 1998 to 2005 for Matriculation Cohorts 1996 through 2003 at SUS Institutions

	1998	1999	2000	2001	2002	2003	2004	2005
Total N of Students	11,113	18,482	28,991	34,406	38,627	41,382	44,191	30,472
	Percent Female							
All Disciplines	61.6%	60.9%	61.1%	60.4%	60.2%	60.1%	60.1%	60.5%
Agriculture and Food Sciences	50.3%	54.1%	59.5%	68.1%	63.6%	66.7%	60.1%	58.8%
Environmental and Forestry Sciences	44.4%	48.5%	52.6%	51.5%	60.4%	53.5%	56.4%	50.4%
Architecture and Environmental Design	12.5%	26.3%	27.9%	32.4%	33.3%	42.1%	41.3%	43.7%

	1998	1999	2000	2001	2002	2003	2004	2005
Total N of Students	11,113	18,482	28,991	34,406	38,627	41,382	44,191	30,472
Other Social Sciences	92.3%	62.5%	76.9%	71.4%	63.9%	73.2%	73.1%	64.3%
Mass Communication	67.7%	64.1%	69.2%	69.9%	73.3%	72.4%	74.8%	74.2%
Computer and Information Sciences	28.0%	32.1%	28.3%	29.2%	27.4%	27.1%	22.7%	22.5%
Education	80.4%	81.5%	83.8%	83.3%	84.3%	83.2%	84.1%	86.3%
Engineering	15.9%	19.2%	22.1%	23.3%	24.2%	21.4%	20.8%	23.3%
Engineering Technology	4.7%	6.8%	9.6%	11.7%	10.8%	17.0%	7.4%	13.5%
Foreign Languages	72.4%	65.7%	76.3%	66.5%	70.3%	69.9%	71.9%	68.4%
Human Sciences	86.0%	83.3%	84.7%	85.9%	82.4%	81.5%	82.8%	81.4%
Law	67.8%	64.4%	73.7%	64.1%	72.8%	62.8%	68.2%	70.8%
Letters	67.5%	69.7%	69.1%	71.5%	69.1%	68.9%	70.3%	69.4%
Liberal/General Studies	58.5%	63.8%	68.2%	62.2%	66.3%	68.4%	67.2%	70.2%
Biological Sciences	51.2%	58.0%	58.3%	61.4%	60.7%	60.5%	62.9%	60.7%
Mathematical Sciences	45.7%	56.2%	61.6%	43.0%	51.7%	45.1%	46.8%	50.0%
Interdisciplinary Sciences	49.1%	52.6%	57.6%	63.8%	54.2%	58.5%	65.2%	66.2%
Parks, Recreation, Leisure and Fitness	64.2%	56.8%	66.9%	56.0%	56.7%	60.4%	58.0%	60.1%
Philosophy, Religion, Theology	36.4%	45.3%	32.6%	45.7%	43.4%	46.1%	34.9%	35.0%
Physical And Related Sciences	39.3%	41.5%	41.6%	46.4%	43.0%	44.0%	45.8%	45.5%
Psychology	77.5%	79.8%	80.4%	77.8%	80.5%	78.8%	80.4%	80.0%
Protective Services	46.2%	44.0%	49.5%	49.9%	52.5%	54.7%	49.5%	54.2%
Public Administration And Services	81.4%	79.5%	82.6%	84.2%	83.8%	85.3%	85.5%	83.8%
Social And Political Sciences	54.9%	51.6%	54.3%	54.4%	53.9%	55.4%	54.9%	53.3%
Visual and Performing Arts	60.5%	59.6%	62.9%	64.4%	63.4%	63.0%	62.2%	63.3%
Health Professions & Related Sciences	79.1%	81.0%	83.6%	85.2%	84.9%	86.5%	86.9%	86.8%
Business and Management	45.3%	48.2%	48.2%	47.7%	47.1%	48.7%	49.7%	48.8%
History						39.7%	36.3%	39.1%
	Percent Underrepresented Minority (Black and Hispanic)							
All Disciplines	19.3%	20.9%	22.6%	24.9%	25.9%	26.9%	27.1%	27.8%
Agriculture and Food Sciences	17.6%	13.0%	13.2%	17.8%	20.3%	19.8%	19.8%	22.1%
Environmental and Forestry Sciences	6.2%	7.6%	9.2%	10.5%	16.3%	21.7%	17.1%	9.9%
Architecture and Environmental Design	56.3%	35.5%	37.7%	35.3%	27.9%	39.3%	34.5%	32.4%
Other Social Sciences	23.1%	33.3%	23.1%	31.4%	42.6%	39.3%	40.3%	48.2%
Mass Communication	18.3%	16.5%	18.6%	21.6%	23.4%	23.7%	25.5%	26.1%

	1998	1999	2000	2001	2002	2003	2004	2005
Total N of Students	11,113	18,482	28,991	34,406	38,627	41,382	44,191	30,472
Computer and Information Sciences	22.0%	26.5%	27.4%	22.0%	23.4%	25.2%	27.5%	28.8%
Education	16.1%	18.0%	20.5%	22.2%	22.7%	24.3%	21.6%	24.4%
Engineering	21.6%	24.3%	23.2%	25.7%	28.6%	25.9%	26.1%	27.7%
Engineering Technology	14.1%	13.5%	11.2%	23.3%	26.2%	22.0%	23.5%	19.4%
Foreign Languages	44.7%	42.9%	33.3%	40.3%	31.7%	40.4%	35.5%	31.1%
Human Sciences	22.7%	22.1%	24.5%	25.5%	27.1%	23.5%	24.3%	26.7%
Law	27.1%	20.8%	23.1%	23.2%	13.6%	29.0%	24.3%	27.5%
Letters	16.4%	19.2%	19.1%	22.3%	23.1%	24.1%	23.0%	24.7%
Liberal/General Studies	14.5%	18.0%	19.9%	18.8%	18.3%	18.9%	19.7%	17.0%
Biological Sciences	14.9%	16.3%	24.7%	24.5%	25.8%	29.6%	29.1%	28.5%
Mathematical Sciences	17.1%	19.2%	17.4%	17.4%	21.8%	17.9%	28.8%	24.3%
Interdisciplinary Sciences	19.3%	25.6%	16.0%	18.4%	20.3%	23.3%	21.9%	25.9%
Parks, Recreation, Leisure and Fitness	23.5%	19.3%	17.4%	23.4%	18.3%	20.4%	19.9%	24.5%
Philosophy, Religion, Theology	18.2%	13.3%	14.1%	18.6%	19.7%	20.6%	18.3%	28.9%
Physical And Related Sciences	16.4%	21.8%	25.1%	28.9%	21.8%	25.1%	27.5%	25.4%
Psychology	22.3%	23.4%	25.8%	29.2%	30.3%	30.4%	30.8%	32.6%
Protective Services	27.1%	26.4%	32.0%	32.2%	32.3%	36.3%	36.3%	36.4%
Public Administration And Services	40.0%	40.5%	42.6%	44.3%	45.4%	45.7%	43.3%	44.6%
Social And Political Sciences	18.2%	20.3%	21.3%	23.0%	26.1%	25.4%	28.9%	28.4%
Visual and Performing Arts	20.2%	17.3%	21.6%	20.5%	19.0%	21.6%	19.7%	23.9%
Health Professions & Related Sciences	20.7%	25.2%	25.0%	30.0%	33.4%	33.8%	36.7%	32.2%
Business and Management	15.9%	18.7%	20.9%	24.0%	25.2%	26.8%	26.9%	27.9%
History						16.3%	14.4%	17.6%
	Percent Black							
All Disciplines	8.1%	8.4%	10.0%	11.3%	12.2%	12.8%	12.9%	13.1%
Agriculture and Food Sciences	4.8%	2.9%	6.3%	10.1%	9.2%	10.0%	11.2%	9.9%
Environmental and Forestry Sciences	1.2%	3.8%	3.1%	1.5%	5.4%	8.0%	6.2%	2.3%
Architecture and Environmental Design	0.0%	3.9%	9.7%	9.8%	6.4%	10.3%	11.9%	11.3%
Other Social Sciences	7.7%	16.7%	12.8%	22.9%	31.1%	37.5%	26.9%	30.4%
Mass Communication	7.4%	6.4%	7.4%	8.7%	9.0%	10.3%	10.2%	10.2%
Computer and Information Sciences	5.3%	9.3%	12.9%	11.9%	14.7%	14.4%	16.2%	14.7%
Education	6.1%	7.3%	8.8%	10.5%	10.2%	11.0%	9.6%	10.7%

	1998	1999	2000	2001	2002	2003	2004	2005
Total N of Students	11,113	18,482	28,991	34,406	38,627	41,382	44,191	30,472
Engineering	4.3%	7.2%	11.6%	9.4%	11.6%	9.7%	9.7%	12.4%
Engineering Technology	4.7%	5.4%	3.7%	10.5%	16.8%	13.1%	14.2%	8.6%
Foreign Languages	9.2%	13.3%	4.0%	12.3%	8.3%	12.0%	13.1%	10.4%
Human Sciences	13.3%	13.5%	15.0%	16.3%	18.1%	15.0%	15.7%	16.3%
Law	8.5%	8.9%	9.6%	14.1%	4.9%	18.8%	13.7%	14.6%
Letters	7.5%	7.1%	8.2%	10.6%	10.8%	10.4%	11.6%	10.8%
Liberal/General Studies	5.7%	8.0%	7.3%	8.1%	7.9%	6.5%	7.7%	6.1%
Biological Sciences	4.5%	6.0%	10.8%	10.9%	11.7%	13.5%	13.9%	12.6%
Mathematical Sciences	11.4%	11.0%	10.1%	7.4%	12.2%	10.4%	18.0%	9.6%
Interdisciplinary Sciences	7.0%	16.7%	11.1%	6.6%	11.8%	12.4%	11.8%	18.0%
Parks, Recreation, Leisure and Fitness	4.9%	8.0%	7.7%	11.1%	7.3%	10.1%	10.0%	12.5%
Philosophy, Religion, Theology	4.5%	4.0%	5.4%	4.7%	10.4%	7.8%	7.3%	6.7%
Physical And Related Sciences	6.6%	11.3%	12.9%	8.1%	10.2%	12.2%	11.0%	11.5%
Psychology	9.3%	7.2%	9.7%	12.7%	12.7%	12.3%	12.6%	15.1%
Protective Services	14.0%	15.4%	18.1%	18.6%	19.4%	23.2%	22.6%	21.3%
Public Administration And Services	23.5%	23.9%	27.9%	26.8%	28.8%	31.4%	28.7%	29.9%
Social And Political Sciences	8.9%	7.7%	8.9%	11.3%	13.5%	13.3%	15.0%	14.7%
Visual and Performing Arts	7.9%	4.7%	8.4%	7.2%	6.3%	9.1%	7.3%	9.4%
Health Professions & Related Sciences	12.4%	13.9%	14.7%	18.5%	21.4%	22.2%	23.8%	21.0%
Business and Management	5.0%	5.7%	7.6%	8.7%	10.2%	11.2%	11.1%	11.1%
History						4.1%	6.3%	6.8%
	Percent Hispanic							
All Disciplines	11.2%	12.5%	12.6%	13.6%	13.7%	14.0%	14.2%	14.7%
Agriculture and Food Sciences	12.8%	10.1%	6.9%	7.7%	11.2%	9.8%	8.6%	12.2%
Environmental and Forestry Sciences	4.9%	3.8%	6.1%	9.0%	10.9%	13.7%	10.9%	7.6%
Architecture and Environmental Design	56.3%	31.6%	27.9%	25.4%	21.5%	29.0%	22.6%	21.2%
Other Social Sciences	15.4%	16.7%	10.3%	8.6%	11.5%	1.8%	13.4%	17.9%
Mass Communication	10.9%	10.1%	11.2%	12.9%	14.3%	13.4%	15.3%	15.9%
Computer and Information Sciences	16.7%	17.2%	14.5%	10.1%	8.7%	10.8%	11.3%	14.1%
Education	10.0%	10.8%	11.7%	11.6%	12.5%	13.3%	12.0%	13.6%
Engineering	17.2%	17.1%	11.6%	16.3%	17.0%	16.2%	16.4%	15.3%
Engineering Technology	9.4%	8.1%	7.5%	12.8%	9.4%	8.9%	9.3%	10.8%

	1998	1999	2000	2001	2002	2003	2004	2005
Total N of Students	11,113	18,482	28,991	34,406	38,627	41,382	44,191	30,472
Foreign Languages	35.5%	29.5%	29.4%	28.0%	23.4%	28.4%	22.4%	20.8%
Human Sciences	9.3%	8.6%	9.5%	9.2%	9.0%	8.5%	8.6%	10.4%
Law	18.6%	11.9%	13.5%	9.2%	8.6%	10.1%	10.6%	12.9%
Letters	8.8%	12.1%	10.9%	11.6%	12.3%	13.7%	11.5%	13.9%
Liberal/General Studies	8.8%	9.9%	12.7%	10.8%	10.4%	12.3%	12.0%	10.8%
Biological Sciences	10.3%	10.4%	13.8%	13.5%	14.1%	16.1%	15.3%	15.8%
Mathematical Sciences	5.7%	8.2%	7.2%	9.9%	9.5%	7.5%	10.7%	14.7%
Interdisciplinary Sciences	12.3%	9.0%	4.9%	11.8%	8.5%	10.9%	10.1%	7.9%
Parks, Recreation, Leisure and Fitness	18.5%	11.4%	9.7%	12.3%	11.0%	10.3%	9.8%	12.0%
Philosophy, Religion, Theology	13.6%	9.3%	8.7%	14.0%	9.2%	12.8%	11.0%	22.2%
Physical And Related Sciences	9.8%	10.6%	12.2%	20.8%	11.6%	12.9%	16.5%	14.0%
Psychology	13.0%	16.2%	16.1%	16.5%	17.5%	18.0%	18.2%	17.5%
Protective Services	13.0%	10.9%	13.9%	13.5%	12.9%	13.1%	13.7%	15.2%
Public Administration And Services	16.5%	16.6%	14.7%	17.5%	16.6%	14.3%	14.6%	14.7%
Social And Political Sciences	9.2%	12.6%	12.5%	11.7%	12.6%	12.1%	14.0%	13.6%
Visual and Performing Arts	12.3%	12.6%	13.3%	13.3%	12.6%	12.5%	12.3%	14.4%
Health Professions & Related Sciences	8.3%	11.4%	10.3%	11.6%	12.0%	11.6%	13.0%	11.2%
Business and Management	10.9%	12.9%	13.3%	15.4%	15.0%	15.6%	15.8%	16.8%
History						12.2%	8.2%	10.9%

Table 7 shows the percent of a cohort for each of the groups of interest that is admitted to a specific discipline for the groups under study. Not surprisingly, these tend to parallel the graduation percentages in Table 6.

Table 7
Percent of Students Admitted to and Enrolled in Broad Disciplines by Race/Ethnicity and Sex that Initially Enrolled during Matriculation Years 1996 through 2003 at SUS Institutions

Broad Discipline	1996	1997	1998	1999	2000	2001	2002	2003
	Percent Female							
Total N of Students	52,609	56,708	57,622	60,975	62,901	64,471	66,682	67,152
All Disciplines	56.5%	57.1%	57.4%	57.6%	57.9%	57.4%	58.2%	58.1%
Agriculture and Food Sciences	59.1%	57.7%	63.1%	63.1%	60.1%	62.4%	61.4%	61.5%
Environmental and Forestry Sciences	51.9%	47.8%	54.9%	54.9%	52.2%	51.6%	59.9%	55.1%
Architecture and Environmental Design	27.5%	34.6%	35.0%	36.6%	38.9%	38.1%	36.1%	37.1%
Other Social Sciences	70.7%	63.8%	67.2%	70.8%	76.1%	76.5%	63.7%	66.7%
Mass Communication	63.5%	67.2%	67.8%	70.3%	71.3%	71.2%	71.7%	73.8%
Computer and Information Sciences	25.9%	24.8%	26.3%	26.5%	22.7%	21.6%	18.8%	16.5%
Education	78.4%	79.3%	82.0%	82.1%	82.7%	80.9%	81.9%	82.6%
Engineering	19.9%	20.9%	19.9%	19.5%	20.2%	19.1%	18.2%	18.4%
Engineering Technology	11.6%	14.0%	14.2%	12.8%	12.9%	12.6%	13.2%	12.2%
Foreign Languages	69.0%	70.0%	69.9%	67.9%	70.0%	69.1%	66.8%	68.1%
Human Sciences	82.8%	84.8%	78.1%	80.9%	80.1%	79.6%	78.8%	79.3%
Law	66.2%	61.1%	67.3%	63.0%	67.0%	66.1%	66.2%	68.8%
Letters	63.9%	65.7%	66.8%	66.9%	68.1%	66.9%	68.3%	66.8%
Liberal/General Studies	55.4%	56.9%	55.5%	55.9%	58.4%	59.6%	57.5%	56.5%
Biological Sciences	57.9%	59.7%	62.5%	62.1%	63.6%	62.8%	64.1%	64.8%
Mathematical Sciences	46.6%	44.1%	49.6%	45.5%	46.0%	44.4%	45.4%	40.5%
Interdisciplinary Sciences	62.7%	63.3%	62.0%	64.2%	61.7%	64.2%	64.7%	62.0%
Parks, Recreation, Leisure and Fitness	61.4%	56.1%	54.1%	56.2%	55.6%	57.8%	53.6%	58.9%
Philosophy, Religion, Theology	31.5%	41.8%	42.7%	38.8%	40.8%	34.4%	34.7%	32.0%
Physical And Related Sciences	40.8%	43.0%	44.5%	42.6%	44.2%	41.8%	46.6%	48.4%
Psychology	76.1%	77.4%	77.9%	77.2%	78.4%	78.0%	78.6%	77.4%
Protective Services	45.2%	48.8%	48.1%	50.2%	51.4%	51.6%	51.1%	53.7%
Public Administration And Services	81.8%	77.7%	80.6%	82.2%	82.9%	83.2%	82.8%	83.1%
Social And Political Sciences	53.8%	53.5%	54.4%	54.1%	53.9%	53.2%	53.6%	54.5%

Broad Discipline	1996	1997	1998	1999	2000	2001	2002	2003
Visual and Performing Arts	58.2%	59.0%	58.7%	59.5%	59.9%	59.2%	59.8%	57.0%
Health Professions & Related Sciences	80.1%	80.6%	82.0%	84.5%	84.3%	84.0%	85.4%	84.2%
Business and Management	46.4%	47.3%	47.0%	47.3%	48.1%	47.9%	48.6%	48.6%
History	35.0%	38.7%	37.0%	38.4%	36.4%	38.3%	37.3%	37.7%
	Percent Underrepresented Minority (Black and Hispanic)							
All Disciplines	27.8%	27.2%	28.3%	29.3%	28.8%	29.8%	30.3%	31.2%
Agriculture and Food Sciences	18.5%	19.3%	22.3%	21.8%	25.6%	21.8%	23.0%	21.9%
Environmental and Forestry Sciences	10.6%	14.6%	20.8%	20.1%	14.4%	18.0%	13.4%	19.5%
Architecture and Environmental Design	41.2%	42.6%	45.2%	45.4%	42.0%	41.1%	42.7%	48.4%
Other Social Sciences	48.3%	36.2%	50.0%	47.2%	43.3%	43.5%	37.4%	44.4%
Mass Communication	23.7%	24.5%	25.7%	27.9%	27.4%	27.8%	29.7%	30.2%
Computer and Information Sciences	33.9%	31.6%	31.2%	30.5%	31.7%	31.1%	31.2%	32.8%
Education	24.1%	23.3%	25.0%	25.4%	24.9%	25.2%	27.0%	27.1%
Engineering	30.2%	29.2%	29.2%	27.8%	28.2%	31.3%	31.3%	32.0%
Engineering Technology	27.7%	28.3%	24.5%	26.2%	27.2%	27.7%	25.7%	24.8%
Foreign Languages	42.8%	32.9%	36.7%	39.5%	36.9%	34.8%	36.5%	32.4%
Human Sciences	23.9%	25.4%	25.3%	26.5%	25.1%	24.1%	28.6%	25.5%
Law	27.2%	19.4%	23.1%	26.0%	24.8%	33.2%	24.7%	24.2%
Letters	23.7%	22.5%	23.0%	23.6%	23.1%	25.1%	24.6%	23.4%
Liberal/General Studies	30.1%	27.0%	29.2%	29.8%	27.2%	28.1%	31.4%	34.2%
Biological Sciences	28.2%	29.5%	30.1%	33.5%	33.3%	34.1%	32.6%	34.6%
Mathematical Sciences	28.4%	27.9%	23.9%	27.2%	24.7%	25.0%	26.0%	23.3%
Interdisciplinary Sciences	28.2%	25.2%	24.8%	29.7%	24.0%	27.2%	26.7%	27.1%
Parks, Recreation, Leisure and Fitness	20.1%	20.3%	19.6%	21.8%	21.5%	21.2%	21.1%	20.6%
Philosophy, Religion, Theology	19.1%	21.8%	25.3%	16.8%	20.6%	21.3%	23.8%	19.9%
Physical And Related Sciences	27.5%	29.4%	28.5%	28.5%	30.9%	29.2%	30.2%	31.9%
Psychology	29.2%	29.7%	31.4%	32.2%	30.0%	33.0%	31.2%	33.5%
Protective Services	35.0%	33.1%	36.3%	36.6%	34.7%	39.5%	37.7%	38.6%
Public Administration And Services	44.8%	46.1%	43.4%	43.7%	44.1%	45.5%	44.1%	48.5%
Social And Political Sciences	28.0%	27.2%	30.0%	29.1%	30.0%	29.0%	29.9%	29.3%
Visual and Performing Arts	22.4%	22.0%	24.6%	23.1%	21.9%	25.4%	24.7%	25.5%
Health Professions & Related Sciences	31.5%	32.1%	33.1%	37.4%	37.5%	38.0%	40.4%	40.4%
Business and Management	27.1%	26.3%	27.0%	28.1%	28.0%	28.6%	29.4%	30.4%
History	16.6%	17.5%	16.4%	18.9%	18.6%	19.1%	16.4%	17.6%

Broad Discipline	1996	1997	1998	1999	2000	2001	2002	2003
	Percent Black							
All Disciplines	13.2%	13.1%	14.0%	14.0%	14.4%	14.3%	14.2%	14.3%
Agriculture and Food Sciences	8.7%	11.0%	11.4%	13.4%	16.2%	11.8%	13.7%	9.9%
Environmental and Forestry Sciences	2.6%	5.0%	8.3%	9.5%	4.7%	6.4%	3.1%	8.2%
Architecture and Environmental Design	12.8%	13.9%	14.0%	14.8%	15.2%	16.3%	16.1%	22.2%
Other Social Sciences	36.2%	23.2%	36.2%	36.1%	38.8%	30.6%	19.8%	25.9%
Mass Communication	10.2%	9.7%	10.6%	11.1%	11.7%	10.9%	11.2%	12.1%
Computer and Information Sciences	16.1%	16.7%	18.0%	16.0%	17.6%	16.8%	15.1%	15.8%
Education	11.2%	11.6%	11.6%	12.8%	12.1%	12.3%	12.4%	12.9%
Engineering	14.3%	13.2%	13.7%	11.7%	13.2%	13.8%	13.1%	12.7%
Engineering Technology	16.6%	14.0%	13.3%	15.1%	12.9%	13.9%	13.4%	13.5%
Foreign Languages	10.9%	9.4%	10.8%	10.8%	14.6%	12.4%	11.5%	10.3%
Human Sciences	18.4%	18.3%	18.8%	18.5%	17.5%	15.0%	18.3%	15.6%
Law	12.8%	10.2%	12.7%	11.3%	16.7%	20.4%	14.3%	12.5%
Letters	11.1%	11.5%	11.2%	10.5%	11.8%	11.7%	11.2%	11.1%
Liberal/General Studies	10.3%	8.6%	9.2%	8.7%	8.6%	7.7%	7.8%	7.7%
Biological Sciences	12.5%	13.3%	13.8%	16.1%	16.5%	16.2%	15.7%	15.5%
Mathematical Sciences	16.3%	15.5%	15.8%	18.7%	13.7%	14.4%	12.3%	11.1%
Interdisciplinary Sciences	19.8%	15.4%	17.5%	16.0%	15.2%	16.8%	13.1%	14.6%
Parks, Recreation, Leisure and Fitness	11.6%	11.2%	9.6%	12.0%	12.0%	10.2%	10.4%	10.1%
Philosophy, Religion, Theology	6.8%	6.1%	12.4%	7.2%	7.0%	9.5%	10.0%	4.7%
Physical And Related Sciences	12.1%	11.6%	15.6%	12.3%	14.9%	13.7%	12.6%	14.1%
Psychology	11.8%	12.7%	14.3%	13.8%	13.9%	14.4%	12.8%	14.5%
Protective Services	20.5%	19.9%	22.8%	21.9%	21.0%	24.8%	21.9%	21.0%
Public Administration And Services	28.7%	29.1%	28.2%	27.3%	30.3%	29.6%	27.5%	31.2%
Social And Political Sciences	14.7%	15.1%	16.2%	15.9%	17.0%	14.9%	16.2%	14.4%
Visual and Performing Arts	8.4%	9.1%	10.2%	9.4%	10.0%	10.0%	10.1%	10.2%
Health Professions & Related Sciences	20.7%	20.4%	21.5%	24.0%	25.4%	24.8%	26.7%	26.8%
Business and Management	11.1%	11.0%	12.1%	11.8%	12.2%	12.3%	12.0%	12.4%
History	6.0%	7.2%	6.1%	8.3%	7.3%	8.5%	7.4%	6.6%
	Percent Hispanic							
All Disciplines	14.6%	14.1%	14.4%	15.3%	14.4%	15.5%	16.1%	16.9%
Agriculture and Food Sciences	9.8%	8.3%	11.0%	8.4%	9.4%	10.1%	9.3%	12.1%
Environmental and Forestry Sciences	7.9%	9.6%	12.5%	10.6%	9.7%	11.7%	10.3%	11.3%

Broad Discipline	1996	1997	1998	1999	2000	2001	2002	2003
Architecture and Environmental Design	28.4%	28.7%	31.2%	30.6%	26.8%	24.8%	26.6%	26.2%
Other Social Sciences	12.1%	13.0%	13.8%	11.1%	4.5%	12.9%	17.6%	18.5%
Mass Communication	13.5%	14.8%	15.1%	16.9%	15.7%	16.9%	18.5%	18.1%
Computer and Information Sciences	17.8%	14.9%	13.2%	14.5%	14.1%	14.3%	16.1%	17.0%
Education	12.8%	11.7%	13.4%	12.6%	12.8%	12.9%	14.5%	14.3%
Engineering	15.9%	15.9%	15.5%	16.2%	15.0%	17.4%	18.2%	19.3%
Engineering Technology	11.1%	14.3%	11.2%	11.1%	14.3%	13.7%	12.3%	11.2%
Foreign Languages	31.9%	23.5%	25.9%	28.7%	22.3%	22.4%	25.0%	22.1%
Human Sciences	5.5%	7.1%	6.5%	8.0%	7.5%	9.2%	10.3%	9.9%
Law	14.4%	9.3%	10.4%	14.7%	8.2%	12.8%	10.4%	11.7%
Letters	12.6%	11.0%	11.8%	13.1%	11.3%	13.4%	13.3%	12.3%
Liberal/General Studies	19.8%	18.3%	20.0%	21.1%	18.6%	20.4%	23.6%	26.5%
Biological Sciences	15.8%	16.1%	16.3%	17.4%	16.8%	17.9%	16.8%	19.1%
Mathematical Sciences	12.1%	12.4%	8.1%	8.6%	11.0%	10.6%	13.7%	12.2%
Interdisciplinary Sciences	8.5%	9.8%	7.3%	13.6%	8.8%	10.5%	13.6%	12.5%
Parks, Recreation, Leisure and Fitness	8.4%	9.1%	10.0%	9.8%	9.5%	11.0%	10.8%	10.5%
Philosophy, Religion, Theology	12.3%	15.7%	12.9%	9.6%	13.6%	11.8%	13.8%	15.2%
Physical And Related Sciences	15.4%	17.8%	12.9%	16.1%	16.0%	15.5%	17.5%	17.7%
Psychology	17.4%	17.0%	17.1%	18.3%	16.1%	18.6%	18.5%	19.0%
Protective Services	14.5%	13.2%	13.4%	14.7%	13.7%	14.8%	15.9%	17.7%
Public Administration And Services	16.1%	17.0%	15.1%	16.4%	13.8%	15.9%	16.6%	17.3%
Social And Political Sciences	13.3%	12.1%	13.7%	13.1%	13.0%	14.1%	13.7%	14.9%
Visual and Performing Arts	14.0%	12.9%	14.4%	13.7%	12.0%	15.4%	14.6%	15.4%
Health Professions & Related Sciences	10.8%	11.7%	11.5%	13.3%	12.1%	13.3%	13.7%	13.5%
Business and Management	15.9%	15.3%	14.9%	16.3%	15.8%	16.3%	17.3%	18.1%
History	10.6%	10.3%	10.3%	10.6%	11.3%	10.6%	9.0%	11.0%

Graduation Efficiencies - Graduation Percentages Minus Entry Percentages

To estimate retention/graduation efficiency changes over time within broad discipline areas, the difference between the average of the last three years and first three years in the eight-years of graduation proportions (1998 through 2005) and entry proportions (1996 through 2003) were computed separately for each discipline area.

Table 8 is a summary by Race/Ethnicity and Sex of two types of efficiencies:

- Percent of subgroup (Female, Black, Hispanic) in graduation group minus percent in initial total matriculation cohort, and
- percent of subgroup in graduation group minus percent in initial discipline group.

First, negative percentages in Table 8 show that the subgroup (female, Black and Hispanic) has somewhat lower representation in the graduation class than in the entry group. The top parts of the table compare total entry cohorts with graduation percentages; the bottom compares entry cohort percentages within discipline to graduation percentages. For purposes of developing these tables, broad discipline codes (2-character CIP codes) were used. Thus, Engineering reflects all sub-disciplines within CIP 14. Mathematics and the Physical Sciences contain all in CIP code groups 27 and 40. Biological and Health Sciences include CIP codes 26 and 51. For these combined disciplines, values shown in the table equal the mean/median of the two values for the two different broad discipline CIP codes.

Second, it is important to note that a two year lag between the comparisons for all years is assumed, because historically this is the period of time generally required for transfer students to complete the required coursework for graduation. As a result, these are not comparisons of precisely the same students from entry cohort to exit cohort, adding some error to the estimates. However, the comparatively stable nature of these large-sample estimates reduces the effects of this error.

Finally, as indicated in the first row of the table, females tend to graduate at a greater rate then they enter. Nonetheless, this advantage drops off from 4.6% to 3.2% between graduation years 1998 and 2001. We also see that Blacks and Hispanics graduate at a lower rate, and that this disadvantage also reduces, from respectively -5.3% to -3.4% for Blacks and from -2.3% to -1.1% for Hispanics. In fact, almost all percentages shown in the table drop off moving from right to left. These trends may result from high percentages of transfer students in the earlier graduation years and increasing percentages of FTIC students in all years from 2000 through 2005

A Few Key Points About Efficiencies

From Matriculation to Graduation:

- Relative to their presence in the total population (Table 8), females are substantially underrepresented in Engineering (35% to 40%) and in Mathematics and the Physical Sciences (10%) and overrepresented in the Biological and Health Fields (10% to 16%).

- Blacks show comparatively low representation in Engineering (7% to 4% below their 13% in the general population), and Hispanics in Mathematics and Physical Sciences in the first two years (5% below their 14% in the population).

Table 8
Graduation Minus Institution Entry, Smoothed* Efficiencies for Females, Blacks and Hispanics
SUS-Wide Totals for 1996 through 2003 Undergraduate Student Cohorts**

			Entry Years							
			1996	1997	1998	1999	2000	2001	2002	2003
	Entry		Graduation Years							
	%	N	1998	1999	2000	2001	2002	2003	2004	2005
Graduation Percent Minus Initial Percent of Entry Population										
	All Disciplines									
Females	57.3%	292,811	4.6%	4.4%	3.7%	3.2%	2.9%	2.6%	2.7%	2.5%
Black	14.5%	73,683	-5.3%	-5.0%	-4.2%	-3.4%	-2.6%	-2.1%	-1.9%	-1.8%
Hispanic	14.7%	76,252	-2.3%	-2.1%	-1.5%	-1.1%	-1.0%	-1.1%	-1.5%	-1.6%
	Engineering									
Females			-39.1%	-37.7%	-35.6%	-34.2%	-34.4%	-35.4%	-35.7%	-35.7%
Black			-7.7%	-6.1%	-4.7%	-3.7%	-4.4%	-4.4%	-4.2%	-3.8%
Hispanic			3.0%	1.2%	0.6%	0.5%	1.7%	1.5%	0.2%	-0.2%
	Math and Physical Sciences***									
Females			-11.0%	-9.2%	-8.8%	-9.5%	-11.8%	-11.5%	-11.3%	-10.7%
Black			-3.4%	-3.3%	-3.9%	-4.3%	-4.6%	-2.4%	-2.7%	-2.3%
Hispanic			-5.6%	-5.2%	-2.9%	-2.6%	-2.7%	-3.6%	-3.0%	-2.1%
	Biological and Health Sciences***									
Females			10.7%	11.7%	14.1%	14.9%	15.9%	16.2%	16.5%	16.6%
Black			-4.3%	-3.4%	-1.6%	0.1%	1.7%	3.0%	3.0%	3.0%
Hispanic			-4.1%	-3.4%	-2.5%	-1.9%	-1.6%	-1.4%	-1.9%	-2.2%

*The estimates in each cell are smoothed, and reflect a running mean of two (for 1998 and 2005) or three adjacent values, to reduce the effects of idiosyncratic years.

**Note – there is a two year lag between the entry percentages (cohort years 1996 through 2003) and the graduation percentages (graduation years 1998 through 2004-05).

***The mean/median of the two broad disciplines' values.

From Program Entry to Graduation:

One would expect smaller differences here, because all students included were admitted to a program, and this expectation is fulfilled (Table 9). There are minor, but not extremely large differences, with a general increase in efficiencies among underrepresented populations over time (until 2001, this results, as noted earlier, from the earlier graduation groups being primarily comprised of transfer students, who tend to be more white than FTIC cohorts, who, by 2001, make up approximately their proportional part of graduates).

All Disciplines – Females show greater efficiencies than males, and Black students efficiencies improve from -3.0% in graduation year 2001 to -1.2% in 2005. Hispanic efficiencies appear to be comparatively stable over this time, between -1.3% and -2.1%.

Engineering – From 2001 through 2005, females show a consistent 3.0% advantage over males. Blacks are steady at about -2.0% and Hispanics show a decrease from around 0.0% to -2.5% in 2004 and 2005.

Math and Physical Sciences – Females show a 1.5-2.0% advantage, Blacks and Hispanics both show quite variable efficiencies ranging from around zero to -5.0% (Blacks 2001-2002). It does not appear reasonable to interpret the existence of any trends in these data.

Biological and Health Sciences – This is almost the only area where females show a negative efficiency, although it is very close to zero from 2001 through 2005. Blacks show lower efficiencies than in most of the other specific disciplines investigated, with their best at minus 3.1%. Hispanics again exhibit consistency, running between a -1.4% and -2.0% (from 2001 through 2005).

Table 9
Graduation Minus Entry Smoothed* Efficiencies for Females, Blacks and Hispanics – SUS-Wide Totals for 1996 through 2003 Undergraduate Student Cohorts**

			Entry Years							
			1996	1997	1998	1999	2000	2001	2002	2003
	Entry		Graduation Years							
	%	N	1998	1999	2000	2001	2002	2003	2004	2005
Program Graduation Percent Minus Program Entry Percent										
	All Disciplines									
Females	57.5%	281,673	4.4%	4.2%	3.4%	2.9%	2.6%	2.3%	2.3%	2.1%
Black	14.1%	68,252	-4.9%	-4.6%	-3.8%	-3.0%	-2.1%	-1.6%	-1.3%	-1.2%
Hispanic	14.9%	74,420	-2.5%	-2.3%	-1.7%	-1.4%	-1.3%	-1.4%	-1.9%	-2.1%
	Engineering									
Females	19.7%	5,584	-2.8%	-1.1%	1.4%	3.3%	3.4%	3.0%	3.3%	3.8%
Black	13.2%	3,788	-8.0%	-6.0%	-3.5%	-2.0%	-2.7%	-3.0%	-2.6%	-1.9%
Hispanic	16.0%	4,838	1.3%	-0.5%	-0.9%	-0.6%	0.3%	-0.4%	-2.4%	-2.9%
	Math and Physical Sciences***									
Females	44.4%	3,245	2.1%	2.9%	3.5%	2.5%	1.4%	1.3%	1.7%	1.8%
Black	13.9%	1,004	-3.8%	-4.0%	-4.8%	-5.0%	-4.5%	-1.2%	-0.9%	0.0%
Hispanic	13.3%	1,072	-5.8%	-4.2%	-1.2%	-0.3%	-0.9%	-2.6%	-1.8%	-1.3%
	Biological and Health Sciences*									
Females	72.5%	44,076	-2.2%	-1.9%	-0.7%	-0.8%	-0.3%	-0.3%	-0.1%	-0.3%
Black	18.5%	12,024	-7.5%	-6.7%	-5.7%	-4.9%	-4.1%	-3.1%	-3.1%	-3.4%
Hispanic	14.7%	8,406	-3.5%	-3.0%	-2.6%	-2.0%	-2.0%	-1.4%	-1.9%	-2.0%

*The estimates in each cell are smoothed, and reflect a running mean of two (for 1998 and 2005) or three adjacent values, to reduce the effects of idiosyncratic years.

**Note – there is a two year lag between the entry percentages (cohort years 1996 through 2003) and the graduation percentages (graduation years 1998 through 2004-05).

***The mean/median of the two broad disciplines' values.

Summary - Changes in Representation by Race/Ethnicity and Sex

As reported in Table 10 and 11, net changes in representation respectively at entry and graduation within broad disciplines were sorted in descending order by changes among underrepresented minorities (Blacks and Hispanics). Overall, Hispanic students showed the greatest increase in the entry percentages at some 2.2%, with Blacks at half that (1.1%). Part of this effect may occur due to the increasing representation of Black students among CCT students over time (Table 4). Females showed entry increases of 1.4%. Large entry increases (> 4%) among underrepresented minorities occurred in Health Professions, Mass Communications, Biological Sciences, and Protective Services. For specific sub-populations, large increases (>= 3%) occurred for females in Health Professions, Mass Communications, Biological Sciences, Protective Services, Environmental and Forestry, Architecture, Agriculture, Education, Physical Sciences, Law and Public Administration. Among Black students large increases occurred in Health Professions and Architecture, and, among Hispanics, in Mass Communications, Liberal/General Studies, Human Sciences, Other Social Sciences and Interdisciplinary Sciences.

Large decreases were fewer among these groups. For underrepresented minorities (>= 4%) none occurred; for females, (>= 3%), Computer and Information Sciences, Philosophy, Religion and Theology and Human Sciences; for Blacks, Interdisciplinary and Other Social Sciences; and for Hispanics, none.

Table 10
Changes from Average Representation at Entry into Broad Discipline 1996-97 to Average of 2002-03 by Sex and Race/Ethnicity, Sorted by Underrepresented Increase
Entry Cohorts 1998 to 2003

Broad Discipline Area	Female	Underrepresented Minority	Black	Hispanic
All Disciplines	1.4%	3.3%	1.1%	2.2%
Health Professions & Related Sciences	4.5%	8.6%	6.2%	2.3%
Mass Communication	7.4%	5.8%	1.7%	4.2%
Biological Sciences	5.7%	4.7%	2.7%	2.0%
Liberal/General Studies	0.8%	4.3%	-1.8%	6.0%
Protective Services	5.4%	4.2%	1.2%	2.9%
Environmental and Forestry Sciences	7.6%	3.9%	1.8%	2.0%
Architecture and Environmental Design	5.6%	3.7%	5.8%	-2.2%
Agriculture and Food Sciences	3.0%	3.6%	2.0%	1.6%
Education	3.4%	3.3%	1.2%	2.1%
Business and Management	1.7%	3.2%	1.2%	2.0%
Psychology	1.2%	2.9%	1.4%	1.5%
Visual and Performing Arts	-0.2%	2.9%	1.4%	1.5%
Physical And Related Sciences	5.6%	2.6%	1.5%	1.1%
Human Sciences	-4.8%	2.4%	-1.4%	3.8%
Engineering	-2.1%	2.0%	-0.9%	2.9%
Social And Political Sciences	0.4%	2.0%	0.4%	1.6%

Broad Discipline Area	Female	Underrepresented Minority	Black	Hispanic
Philosophy, Religion and Theology	-3.3%	1.3%	0.8%	0.5%
Law	3.8%	1.1%	1.9%	-0.8%
Letters	2.8%	0.9%	-0.1%	1.0%
Public Administration And Services	3.2%	0.8%	0.4%	0.4%
Parks, Recreation, Leisure and Fitness	-2.5%	0.7%	-1.2%	1.9%
Interdisciplinary Sciences	0.3%	0.2%	-3.7%	3.9%
Computer and Information Sciences	-7.7%	-0.7%	-0.9%	0.2%
Other Social Sciences	-2.0%	-1.4%	-6.8%	5.5%
Engineering Technology	-0.1%	-2.8%	-1.8%	-0.9%
Foreign Languages	-2.1%	-3.4%	0.8%	-4.2%
Mathematical Sciences	-2.4%	-3.5%	-4.2%	0.7%

As Table 11 shows, although females show some graduation decreases, for underrepresented minority groups, the changes are generally positive during this time, with all decreases of 1% or less. For females, substantial decreases (3% or more) occur in Mathematics, Law and Computer and Information Sciences. Increases occurred in Mass Communication and Architecture. For Hispanics, only in Foreign Languages (-3.3%) and Environment and Forestry (+4.7%) did substantial changes occur (3% or more). For Blacks, no 3% decreases occur, but several increases of 3% or more include: Other Social Sciences, Environment and Forestry, Health Profession, Mathematics, Engineering Technology, Interdisciplinary Sciences, Social and Political Sciences, Business, Protective Services, Law and Foreign Languages.

Table 11

Changes from Average Representation Among Graduates in Broad Discipline 2000-2001 to Average of 2004-05 by Sex and Race/Ethnicity, Sorted by Underrepresented Increase
Entry Cohorts 1998 to 2003, Graduation Cohorts 1998 to 2005

Broad Discipline Area	Female	Underrepresented Minority	Black	Hispanic
All Disciplines	-0.7%	3.3%	2.3%	1.0%
Other Social Sciences	-1.0%	12.5%	14.3%	-1.8%
Environmental and Forestry Sciences	2.9%	9.5%	4.8%	4.7%
Health Professions & Related Sciences	2.3%	7.7%	6.4%	1.3%
Mathematical Sciences	-6.3%	6.0%	5.4%	0.5%
Engineering Technology	1.6%	5.4%	6.5%	-1.1%
Interdisciplinary Sciences	1.1%	5.4%	3.3%	2.1%
Social And Political Sciences	0.8%	5.0%	4.0%	1.0%
Biological Sciences	1.9%	4.8%	2.8%	2.0%
Mass Communication	4.0%	4.5%	2.2%	2.2%
Business and Management	1.2%	4.4%	3.0%	1.4%
Agriculture and Food Sciences	-0.4%	4.3%	2.4%	1.9%
Protective Services	2.4%	4.3%	4.6%	-0.3%
Law	-3.4%	3.5%	4.4%	-0.9%
Philosophy, Religion, Theology	1.3%	3.1%	2.5%	0.6%
Psychology	0.5%	3.1%	1.3%	1.8%
Letters	-0.7%	2.9%	1.6%	1.3%
Computer and Information Sciences	-3.9%	1.7%	2.9%	-1.2%
Education	0.1%	1.6%	0.7%	1.0%

Broad Discipline Area	Female	Underrepresented Minority	Black	Hispanic
Engineering	-1.6%	1.6%	-0.8%	2.3%
Foreign Languages	-0.5%	1.1%	4.4%	-3.3%
Public Administration And Services	2.0%	1.0%	2.7%	-1.7%
Architecture and Environmental Design	11.5%	0.4%	1.3%	-0.9%
Liberal/General Studies	2.6%	-0.1%	-0.6%	0.5%
Parks, Recreation, Leisure and Fitness	-2.3%	-0.3%	0.7%	-1.0%
Visual and Performing Arts	-1.0%	-0.4%	0.4%	-0.8%
Physical And Related Sciences	0.9%	-0.7%	1.1%	-1.7%
Human Sciences	-3.1%	-1.1%	-0.3%	-0.8%

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