An Attempt to Identify Comparatively Supportive and non-Supportive Environments for Underrepresented Minorities and Females in SUS Colleges of Engineering

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Introduction

This study sought to determine whether consistent differences in enrollment and graduation from different colleges of Engineering occurred in the SUS. Analyses were limited to the major institutions (UF, FSU, USF, UCF, FAU, FIU) with the addition of FAMU due to their high minority enrollment. All of these institutions have Engineering programs. A sample of 138,000 SUS enrollees from the 1996-97 through 1998-99 cohorts were submitted to analysis for FTIC students. In more detailed analyses for Community College Transfers CCTs), two additional years were added (1999-00 and 2000-01) which brought the community college total to 91,148. Some 12,000 students in the first group enrolled in Engineering Courses, as did 8,519 in the second group (CCTs). A final analysis looked only at enrollment in Engineering, and added the 2001-02 to 2003-04 cohorts, bringing the sample size to 35,415 (Table 7).

Analyses suggest that comparatively large variations occur on most variables, although among CCTs, graduation percentages tend to be consistently high. Some key findings are:

- Females do better at Engineering than males (Table 4, Table 5).
- Black students tend to graduate at lower rates then they enroll (Table 4, Table 5).
- Hispanic students enrollment and graduation tendencies vary little (Table 4, Table 5).

Only a limited number of community colleges contribute an adequate number of underrepresented students (Black, Hispanic or Native American) to Colleges of Engineering to be worth study. These include (Miami-Dade, Valencia, Broward, Tallahassee, Palm Beach, Hillsborough and Santa Fe). Brevard contributes about 10 per year. The following hold true for SUS Colleges of Engineering (note that far greater differences occur for First Time in College [FTIC] than for transfer students).

At SUS Institutions Colleges of Engineering

- Black Students – Do comparatively well at FAMU, and comparatively poorly at FIU, FAU and USF.
- Hispanic students – Show only small differences from institution to institution. Usually, larger differences associate with smaller representation, and the largest is about a 10% increase in relative proportions between enrollees and graduates (Table 4).
- Females do better at all schools, although they do least well at UF and best at USF. Other schools looking pretty good for females are FAU, FIU, FSU and UCF.

At the Discipline Level

To obtain reasonable samples eight entry cohorts including both FTIC and CCT students were combined (1996-97 to 2003-04, Table 7, Table 13). Across all major schools, most disciplines lack adequate numbers of students for consideration. The largest are: Computer and Information sciences (3,200), Electrical Engineering (2,100), Computer Engineering (1,500), Mechanical Engineering (1,400) and Civil Engineering (1,300).

Chemical Engineering (600) also has a fairly substantial number. Regarding size of schools, UF and UCF (8,000), FIU, FSU and UCF (4,000) are the largest. FAMU had only 2,300 total students from eight cohorts.

Regarding representation, among the major disciplines, consistently about 30-35% of students are underrepresented minorities (Black, Hispanic, American Indian), and female representation is also consistent, ranging from 18% for Chemical Engineering to 21% for Computer and Information Sciences.

From an institutional perspective, for FAMU, only Computer and Information Science enrolls more than 120 students. It also appears to reflect the typical FAMU representation among minorities and females. FIU is heavily minority across all major disciplines, and low in females, even in Computer and Information sciences. FSU also has fairly consistent representation across the major disciplines. UCF shows one of the more interesting distributions, having lower than average minority representation in Computer and Information sciences and substantially lower in Civil, with higher representation in Electrical and Mechanical. Regarding females, Computer and Information sciences is higher, with Civil and to a lesser extent Electrical showing low representation. Civil Engineering might be interesting at UCF due to the lack of female and minority representation. At UF, all of the major disciplines exhibit somewhat higher than average minority representation. Female representation is also fairly consistent, with only Chemical Engineering showing shortages both among minorities and females. USF is also consistent, with only Mechanical Engineering (16%) showing low representation both for minorities and females.

Among community colleges:

- Black students from Santa Fe, Tallahassee and Broward show higher graduation rates, while those from Palm Beach and Brevard are comparatively low (Table 10, Table 11).
- Hispanic students from Santa Fe and Brevard do comparatively well, while those from Miami-Dade, Valencia and Hillsborough do not (Table 10, Table 11).
- Females have high rates of graduation from almost everywhere; however, Miami-Dade and Brevard are somewhat low, while Santa Fe and Tallahassee are quite high.

Note that a large part of the reason that Santa Fe is high in graduation is that most of their students matriculate at UF, which requires all CCTs to already be admitted to one of their limited access programs. Thus, this is a very select sample of students.

Methods

Analyses were limited to either First Time In College (FTIC) or Community College (CC) transfers. Other transfers were not included.

Data from the 1996-97, 1997-98 and 1998-99 cohorts were combined for these analyses in order to obtain reasonably sized samples of Engineering students and graduates at the various universities. For more detailed analysis of CCTs, two additional cohorts were

added (1999-00 and 2000-01). The last CCT cohort allows four years for graduation. The last FTIC cohort allows six years for graduation, while the first allows eight.

All analyses were conducted using IBM MVS Mainframe SAS in an ISPF environment at the Northwest Regional Data Center (NWRDC), PC SAS (version 9.1), or Microsoft Excel.

Defining Attrition

The purpose of this exercise is to provide a basis for identifying a sample of Florida public community colleges and SUS institutions that are more or less efficient at matriculating, retaining, and graduating underrepresented minorities and females in STEM and Engineering disciplines.

In order to identify and differentiate between institutions that are effective at retaining and graduating underrepresented minorities and women in STEM, and particularly engineering fields, it is first necessary to develop a reasonable definition for retention/attrition. Obviously, the definitions will differ between Florida public community colleges and SUS institutions.

Data Limitations and Issues

Data to evaluate enrollment, retention, articulation and graduation are somewhat limited, but should prove adequate to identify any differences across institutions regarding efficacy for underrepresented minorities and females in STEM and Engineering disciplines that may occur, or at least to an extent adequate to identify a sample of institutions that are more or less efficient at working with these targeted groups.

Community Colleges

A prior study investigating Florida community college quality used statewide Florida data to investigate which community colleges sent large numbers of students to SUS institutions (Micceri, 2005). For community colleges, data are available regarding graduation numbers and populations (SBCCa [1992-2002]) and articulation to Florida's SUS institutions (SBCC [1992-2002]).

Regarding admissions to specific types of programs within the SUS, the SUS Master Admissions Files (SUS MAF, 1995-2005) contains data on students' historical community college performance, race/ethnic characteristics, sex and other demographic variables of interest, as well as, for many, the discipline in which students enroll at a given SUS institution.

SUS Institutions

For SUS institutions, SUS MAF (1995-2005) provides information regarding entry characteristics of all SUS students. Additional, the SUS Retention Database (SUS RD [1995-2004]) provides retention and graduation statistics for these students.

The preceding sources will be used to assess the efficacy of various Florida community colleges and SUS institutions to retain, graduate, and articulate, students having characteristics of interest to this research, and, to determine whether differences occur

among the several institutions regarding efficacy in working with females and underrepresented minorities.

A Few Key Community College Issues

One important issue relating to community college attrition is the incredibly high turnover rate of students in Florida's community colleges. Due to the fact that the only requirement for admission is a Florida high school diploma, many young people will take a course or two just to see how well they like, or how well they do at the community colleges. Generally, three effects can occur as a result of such probes:

- The student loves higher education, or performs well, and develops a strong desire to continue,
- The student neither likes nor dislikes higher education, and
- The student actively dislikes higher education, or performs poorly in courses.

Unfortunately from an attrition perspective, any of these three effects can produce any of the following outcomes:

- The student either continues at the initial community college or transfers to another community college that has programs better suited to his/er needs,
- The student transfers to an SUS or other 4-year institution,
- The student obtains a job that fulfills their current and/or future plans, or
- The student either decides to or is forced to discontinue higher education.

Any of the four outcomes other than continuing at the same community college are usually defined as attrition, although in fact, only the last reflects actual attrition.

As a result of the preceding phenomena, community colleges in Florida have adopted a different definition of a student that SUS institutions. For retention/attrition purposes, Florida community colleges define a student as enrolled if and only if they have completed 18 credit hours at an institution. Even given this restrictive definition, a graduation rate of 20-25% is common among Florida's 28 public community colleges.

An Appropriate Definition of Retention/Attrition

As was noted in the preceding section, transfers between and among Florida SUS and community colleges occur quite frequently. Another factor is that students from a given locale (e.g. USF, Tampa) may attend an SUS institution in another locale during the traditional academic year (e.g. UF, Gainesville), but may return home during the summer and take courses at the local institution (e.g. the author's son), niece and nephew). It is sometimes difficult to distinguish between such courses and an actual transfer, and particularly so when a student does not graduate from an SUS institution.

For the preceding reasons retention/attrition for SUS institutions will be broken into four groups:

	Graduate	Fail to Graduate
Don't transfer		
Transfer		
Quit Engineering Path		

For community college students, because the data are so limited, only articulation to an SUS institution can be effectively used to evaluate success.

Relative Efficiency

Because the traditional institutions like UF enroll students with significantly higher academic preparation out of high school[1] than do less highly rated institutions, an efficiency index, was created to compare across institutions. This is defined as 1.0 subtracted from the percent of a group (e.g. sex or race/ethnic group) in the graduating cohort divided by the percent in the initial cohort. Thus, institutions having higher graduating than entry representation (see Table 4 and Table 5) show positive values and those with lower graduation than entry values are negative.

Results

The total sample included 138,828 undergraduate students, of whom 12,145 began study in either Computer/Information Sciences (Compsci), Engineering (ENG) or Engineering Tech (ENGTech). In this paper, all three of these program areas will be labeled Engineering, unless otherwise specified. Due to small sample sizes at the level of individual institutions, it is not feasible to look at individual program areas by race/ethnicity, although it is feasible to evaluate sex differences. However, since females consistently outperform males in these analyses, it does not appear useful to conduct such detailed analyses. Among the 12,145 students who received a degree having begun in Engineering, only 28 transferred from another major into Engineering and obtained a degree. Therefore, these will not be considered further for the purposes of this study.

Table 1
Breakdown of Engineering Sample – 1996-97 to 1998-99

	Totals		FTIC		CCT	
	N	Percent	N	Percent	N	Percent
Initial Program	12,145		7,030		5,115	
Computer & Info Sci	3,885	32%	2,139	30%	1,746	34%
Percent			55%		45%	
Engineering	7,369	61%	4,488	64%	2,881	56%
Percent			61%		39%	
Engineering Tech	891	7%	403	6%	488	10%
Percent			45%		55%	

Of these 12,145 beginning students, 7,029 (58%) attained a degree within 6-8 years (depending on the cohort – eight years for 1996-97, six years for 1998-99).

Table 2 shows the racial/ethnic breakdown of incoming students by institution separate for FTIC and CCT students. Overall, the percentage of transfer students is 42%, however, this ranges from 10% at FAMU to 61% at FAU. The traditional institutions (UF, FSU and FAMU) tend to have greater percentages of FTIC students in their Engineering programs.

[1] UF has large percentage of AP and IB students, and is the nations leader in National Merit Scholars, etc.

Regarding race/ethnicity, the table shows that Black students are more likely to be FTIC, while Hispanic, other and white students are somewhat more likely to be transfers. Students classified as other are frequently non-resident aliens, which explains why almost twice as many of them come from community colleges. They must first develop adequate English to pass the TOEFL exam or to be successful in classes, and they therefore frequently use a community college for that purpose.

Several differences occur among the institutions, not only in the type of students who attend (FTIC or CCT), but also in the racial/ethnic mix of the students. For example, among FAMU's FTIC students, 95% are Black, while only 78% of their CCT students are Black. Note, however, that this is a small sample of only 85 students during the three cohorts of interest. FAU, FSU, UF and UCF are comparatively low in the number of Black students they enroll from either source, with USF showing a slightly higher percentage. FIU is second only to FAMU regarding minority enrollment, with 55% of both FTIC and CCT populations being Hispanic, and respectively 16% and 12% being Black. Among these schools, only FAMU (888) had fewer than 1,000 Engineering students during the three years of interest.

Table 2
Breakdown by Race/Ethnicity by University – 1996-97 to 1998-99

		Totals		FTIC		CCT	
		N	Percent	N	Percent	N	Percent
	Totals	12,145		7,030		5,115	
	Percent			58%		42%	
	Asian	1,045	9%	571	8%	474	9%
	Black	1,917	16%	1,419	20%	498	10%
	Hispanic	1,920	16%	1,054	15%	866	17%
	Other	668	6%	304	4%	364	7%
	White	6,595	54%	3,682	52%	2,913	57%
FAMU	Totals	888		803		85	
	Percent			90%		10%	
	Asian	6	1%	1	0%	5	6%
	Black	842	95%	776	97%	66	78%
	Hispanic	6	1%	3	0%	3	4%
	Other	16	2%	15	2%	1	1%
	White	18	2%	8	1%	10	12%
FAU	Totals	1,100		432		668	
	Percent			39%		61%	
	Asian	104	9%	42	10%	62	9%
	Black	157	14%	64	15%	93	14%
	Hispanic	147	13%	53	12%	94	14%
	Other	116	11%	41	9%	75	11%
	White	576	52%	232	54%	344	51%

		Totals		FTIC		CCT	
		N	Percent	N	Percent	N	Percent
FIU	Totals	1,631		766		865	
	Percent			47%		53%	
	Asian	105	6%	59	8%	46	5%
	Black	234	14%	95	12%	139	16%
	Hispanic	892	55%	418	55%	474	55%
	Other	157	10%	94	12%	63	7%
	White	243	15%	100	13%	143	17%
FSU	Totals	1,267		892		375	
	Percent			70%		30%	
	Asian	66	5%	53	6%	13	3%
	Black	223	18%	180	20%	43	11%
	Hispanic	89	7%	71	8%	18	5%
	Other	43	3%	34	4%	9	2%
	White	846	67%	554	62%	292	78%
UCF	Totals	2,634		1,192		1,442	
	Percent			45%		55%	
	Asian	246	9%	83	7%	163	11%
	Black	173	7%	94	8%	79	5%
	Hispanic	306	12%	167	14%	139	10%
	Other	143	5%	41	3%	102	7%
	White	1,766	67%	807	68%	959	67%
UF	Totals	3,153		2,145		1,008	
	Percent			68%		32%	
	Asian	337	11%	246	11%	91	9%
	Black	158	5%	121	6%	37	4%
	Hispanic	334	11%	236	11%	98	10%
	Other	102	3%	31	1%	71	7%
	White	2,222	70%	1,511	70%	711	71%
USF	Totals	1,472		800		672	
	Percent			54%		46%	
	Asian	181	12%	87	11%	94	14%
	Black	130	9%	89	11%	41	6%
	Hispanic	146	10%	106	13%	40	6%
	Other	91	6%	48	6%	43	6%
	White	924	63%	470	59%	454	68%

Table 3 provides the same information in Table 2 by sex. Overall, females make up 21% of the population, and this percentage is consistent for both FTIC (22%) and CCT (20%) students. The percentage of females at specific institutions ranges from 36% at FAMU to 17% at UCF and 18% at FIU. All of the schools except FAMU range between 17% and 24% female.

Table 3
Breakdown by Sex by University – 1996-97 to 1998-99

				FTIC		CCT	
		N	Percent	N	Percent	N	Percent
	Totals	12,145		7,030		5,115	
	Percent			58%		42%	
	Female	2,568	21%	1,531	22%	1,037	20%
	Male	9,577	79%	5,499	78%	4,078	80%
FAMU	Totals	888		803		85	
	Percent			90%		10%	
	Female	316	36%	287	36%	29	34%
	Male	572	64%	516	64%	56	66%
FAU	Totals	1,100		432		668	
	Percent			39%		61%	
	Female	259	24%	79	18%	180	27%
	Male	841	76%	353	82%	488	73%
FIU	Totals	1,631		766		865	
	Percent			47%		53%	
	Female	299	18%	127	17%	172	20%
	Male	1,332	82%	639	83%	693	80%
FSU	Totals	1,267		892		375	
	Percent			70%		30%	
	Female	290	23%	201	23%	89	24%
	Male	977	77%	691	77%	286	76%
UCF	Totals	2,634		1,192		1,442	
	Percent			45%		55%	
	Female	454	17%	191	16%	263	18%
	Male	2,180	83%	1,001	84%	1,179	82%
UF	Totals	3,153		2,145		1,008	
	Percent			68%		32%	
	Female	634	20%	491	23%	143	14%
	Male	2,519	80%	1,654	77%	865	86%
USF	Totals	1,472		800		672	
	Percent			54%		46%	
	Female	316	21%	155	19%	161	24%
	Male	1,156	79%	645	81%	511	76%

Table 4 and Table 5 respectively provide indications of graduation percentages relative to initial cohort percentages overall (efficiencies) and for each institution separately for FTIC (Table 4) and CCT students (Table 5). This is the only legitimate way to look at how well various groups of students do at the several institutions because the traditional schools like UF enroll students with significantly higher academic preparation out of high school[2] than do other institutions. FSU is behind UF, but is still considerably above the other schools. Therefore, it would appear most appropriate to evaluate how well these schools work with the various minorities by comparing their entry cohort's characteristics with their graduating students.[3] Table 4 shows that across all of the institutions, the percentages of graduates in racial ethnic groups tend to be comparatively close to the percentages in initial cohorts, with three exceptions of some magnitude:

1. Females represent more than a 17.5% greater portion of the graduate population than of the entry cohort (24.8% to 21.1%). Males, who make up a far greater percentage of the population, do not show losses of such large magnitude (4.2%/78.9% = -5.3%).
2. Black students show a reduction comparable to that of females (-13.9%) between graduation and entry (respectively 17.4% to 20.2%).

Looking at individual institutions, Black students make up a greater portion of the graduation than entry cohort only at FAMU and FSU. They show their greatest loss at FIU (41%[4]), FAU (29%) and USF (34%) [Table 6 provides percentage changes in representation by group].

Hispanic students exhibit comparatively little change between entry and graduation cohorts at any school (excluding those with extremely small percentages of Hispanic students). UF (+11%) and FSU (+9%). show the greatest gains. Only USF (-4.5%) and FAU (0.0%). show other than increases.

Female students, show increases at all schools, although this is smallest at UF (4%), and greatest at USF (31%). Several schools show changes near 20% (FAU, FIU, FSU and UCF).

Asians are similar to females, showing losses only at FSU (-5%).[5]

[2] UF has large percentage of AP and IB students, and is the nations leader in National Merit Scholars, etc.

[3] Table 12, in Appendix A shows how influential the academic preparation of the students is for such evaluation.

[4] In these discussions, losses and gains are proportional to the source population. Thus, FIU had 12.4% Black students in the entry cohort, and only 7.3% in the graduating cohort, representing a reduction of 5.1% against 12.4%, or a 41% reduction.

[5] FAMU has too few Asians to use the percentage changes.

Table 4
FTIC Initial and Graduating Percentages of Students by Race/Ethnicity and Sex within Institutions – 1996-97 to 1998-99

	Totals	Asian	Black	Hispanic	Other	White	Females	Males
Totals	7,020	571	1,422	1,056	305	3,679	1525	5472
Earn Degree	4,205	401	732	607	155	2,323	1041	3141
No Degree	2,815	170	690	449	150	1,356	484	2331
% Graduating	60%	70%	51%	57%	51%	63%	68.3%	57.4%
% of Graduates		9.5%	17.4%	14.4%	3.7%	55.3%	24.8%	74.7%
% of Initial		8.1%	20.2%	15.0%	4.3%	52.4%	21.1%	78.9%
Degree Institution								
FAMU	422	0	412	3	5	2	168	254
% of Graduates		0.0%	97.6%	0.7%	1.2%	0.5%	39.8%	60.2%
% of Initial		0.1%	96.6%	0.4%	1.9%	1.0%	35.7%	64.3%
FAU	171	21	18	21	26	85	37	134
% of Graduates		12.3%	10.5%	12.3%	15.2%	49.7%	21.6%	78.4%
% of Initial		9.7%	14.8%	12.3%	9.5%	53.7%	18.3%	81.7%
FIU	330	35	24	187	46	38	67	263
% of Graduates		10.6%	7.3%	56.7%	13.9%	11.5%	20.3%	79.7%
% of Initial		7.7%	12.4%	54.6%	12.3%	13.1%	16.6%	83.4%
FSU	587	33	124	51	22	357	156	431
% of Graduates		5.6%	21.1%	8.7%	3.7%	60.8%	26.6%	73.4%
% of Initial		5.9%	20.2%	8.0%	3.8%	62.1%	22.5%	77.5%
UCF	595	60	44	87	12	392	113	482
% of Graduates		10.1%	7.4%	14.6%	2.0%	65.9%	19.0%	81.0%
% of Initial		7.0%	7.9%	14.0%	3.4%	67.7%	16.0%	84.0%
UF	1723	201	79	210	22	1211	410	1313
% of Graduates		11.7%	4.6%	12.2%	1.3%	70.3%	23.8%	76.2%
% of Initial		11.5%	5.6%	11.0%	1.4%	70.4%	22.9%	77.1%
USF	354	50	26	45	20	213	90	264
% of Graduates		14.1%	7.3%	12.7%	5.6%	60.2%	25.4%	74.6%
% of Initial		10.9%	11.1%	13.3%	6.0%	58.8%	19.4%	80.6%
Transfer Schools								
UNF	23		2	1	1	19	4	19
FGCU	1					1		1

Generally, among CCTs, large differences between entry proportions and graduation percentages do not occur. Among CCTs, the samples at FAMU are too small to consider. For Black students, only FAMU (6%) and UF (3%) show increases. Substantial losses (16% to 24%) occur at FAU, FIU, UCF and USF. Among Hispanics (FAMU and FSU's numbers are too small to consider), consistent increases occur, which range from a low of 4.3% at FAU to a high of 13.3% at USF. Among Females, at three schools (FAMU, UF, USF) losses of 2% or less occur (effectively no difference). At FIU (10.6%) and FSU (15.2%), females are more common among graduating than entering students.

Table 5
CCT Initial and Graduating Percentages of Students by Race/Ethnicity and Sex within Institutions – 1996-97 to 1998-99

	Totals	Asian	Black	Hispanic	Other	White	Females	Males
Totals	5,108	475	501	868	365	2,913	1,033	4,052
Earn Degree	3,291	357	278	537	257	1,876	683	2,585
No Degree	1,817	118	223	331	108	1,037	350	1,467
% Graduating	64%	75%	55%	62%	70%	64%	66.1%	63.8%
% of Graduates		10.9%	8.4%	16.3%	7.8%	57.0%	20.9%	79.1%
% of Initial		9.3%	9.7%	16.9%	7.1%	57.0%	20.3%	79.7%
Degree Institution								
FAMU	57	5	47	1		4	19	38
% of Graduates		8.8%	82.5%	1.8%	0.0%	7.0%	33.3%	66.7%
% of Initial		5.9%	77.6%	3.5%	1.2%	11.8%	34.1%	65.9%
FAU	388	44	43	57	47	197	109	279
% of Graduates		11.3%	11.1%	14.7%	12.1%	50.8%	28.1%	71.9%
% of Initial		9.3%	13.9%	14.1%	11.2%	51.5%	26.9%	73.1%
FIU	468	29	63	268	44	64	103	365
% of Graduates		6.2%	13.5%	57.3%	9.4%	13.7%	22.0%	78.0%
% of Initial		5.3%	16.1%	54.8%	7.3%	16.5%	19.9%	80.1%
FSU	293	8	33	11	5	236	80	213
% of Graduates		2.7%	11.3%	3.8%	1.7%	80.5%	27.3%	72.7%
% of Initial		3.5%	11.5%	4.8%	2.4%	77.9%	23.7%	76.3%
UCF	796	118	36	81	66	495	155	641
% of Graduates		14.8%	4.5%	10.2%	8.3%	62.2%	19.5%	80.5%
% of Initial		11.3%	5.5%	9.6%	7.1%	66.5%	18.2%	81.8%
UF	852	77	32	89	58	596	119	733
% of Graduates		9.0%	3.8%	10.4%	6.8%	70.0%	14.0%	86.0%
% of Initial		9.0%	3.7%	9.7%	7.0%	70.5%	14.2%	85.8%
USF	414	74	19	28	35	258	98	316
% of Graduates		17.9%	4.6%	6.8%	8.5%	62.3%	23.7%	76.3%
% of Initial		14.0%	6.1%	6.0%	6.4%	67.6%	24.0%	76.0%
Transfer Schools								
UNF	23	1	2		1	19	2	21
FGCU	1					1		

Table 6
Difference Between Graduation and Entry Cohort Percentages for Racial/Ethnic Groups and Sexes by School – 1996-97 to 1998-99 (Small Ns excluded from table)

	Asian	Black	Hispanic	Other	White	Females	Males
	FTIC						
FAMU		1.0%				11.5%	-6.4%
FAU	26.8%	-29.1%	0.0%	60.0%	-7.4%	18.0%	-4.0%
FIU	37.7%	-41.1%	3.8%	13.0%	-12.2%	22.3%	-4.4%
FSU	-5.1%	4.5%	8.7%	-2.6%	-2.1%	18.2%	-5.3%
UCF	44.3%	-6.3%	4.3%	-41.2%	-2.7%	18.8%	-3.6%
UF	1.7%	-17.9%	10.9%	-7.1%	-0.1%	3.9%	-1.2%
USF	29.4%	-34.2%	-4.5%	-6.7%	2.4%	30.9%	-7.4%
	CCTs						
FAMU		6.3%				-2.3%	1.2%
FAU	21.5%	-20.1%	4.3%	8.0%	-1.4%	4.5%	-1.6%
FIU	17.0%	-16.1%	4.6%	28.8%	-17.0%	10.6%	-2.6%
FSU	-22.9%	-1.7%		-29.2%	3.3%	15.2%	-4.7%
UCF	31.0%	-18.2%	6.2%	16.9%	-6.5%	7.1%	-1.6%
UF	0.0%	2.7%	7.2%	-2.9%	-0.7%	-1.4%	0.2%
USF	27.9%	-24.6%	13.3%	32.8%	-7.8%	-1.3%	0.4%

Discipline Specific Data

In order to address the question of discipline specific representation at various colleges, eight entry cohorts including both FTIC and CCT students were combined to obtain adequate representation by institution. Table 7 displays these data first for total SUS by discipline, then grand totals for each institution, followed by discipline specific numbers for each institution. Three primary values are represented: Total number of students, percent of underrepresented minorities and percent female. (Table 13 in Appendix A provides more detail).

The top section of Table 7 shows that even using this many cohorts, and across all major schools, several of the disciplines lack adequate numbers of students for consideration. Those with the largest numbers are respectively: computer and information sciences (3,200), Electrical Engineering (2,100), Computer Engineering (1,500), Mechanical Engineering (1,400) and Civil Engineering (1,300). Chemical Engineering (600) also has a fairly substantial number. Regarding size of schools, UF and UCF (8,000), FIU, FSU and UCF (4,000) are the largest. FAMU had only 2,300 total students from eight cohorts.

Consistent with other data, FAMU (96%) and FIU (68%) have the greatest representation from underrepresented minorities. FAU (33%) and FSU (25%) are the only other schools with more than 25%. UF shows the smallest numbers, with 17.5%, while UCF and USF following close behind at respectively 19.7% and 20.7%. FAMU (32%) is far higher than any other school for female representation. Among the others, only FSU and FAU are above 20% female. UCF (16%) and FIU (18%) are the lowest.

Regarding disciplines, among the major disciplines, consistently about 30-35% of students are underrepresented minorities, while female representation ranges from 18% for Chemical Engineering to 21% for Computer and Information Sciences.

Looking at these data from an institutional perspective, for FAMU, only Computer and Information Science has more than 120 students. It also appears to reflect the typical FAMU representation among minorities and females. FIU is heavily minority across all major disciplines, and low in females, even in Computer and Information sciences. FSU also has fairly consistent representation across the major disciplines. UCF has one of the more interesting distributions, exhibiting lower than average minority representation in Computer and Information sciences and substantially lower in Civil, with higher representation in Electrical and Mechanical. Regarding females, Computer and Information sciences is higher, with Civil and to a lesser extent Electrical showing low representation. Civil Engineering might be interesting at UCF due to the lack of female and minority representation. At UF, all of the major disciplines exhibit somewhat higher than average minority representation. Female representation is also fairly consistent, with only Chemical Engineering showing shortages both among minorities and females. USF is also consistent, with only Mechanical Engineering (16%) showing low representation both for minorities and females.

Table 7

Totals by Discipline for SUS Institutions – 1996-97 to 2003-04

	Total	Underrepresented Minority	Female
All	35,515	32.2%	19.6%
Computer & Info Sci	3,230	32.6%	20.9%
Info Tech	273	33.7%	17.6%
Computer Info Sys	575	30.8%	16.7%
Biomedical Eng	8	50.0%	12.5%
Chemical Eng	615	34.1%	17.7%
Civil Eng	1,335	31.2%	19.3%
Computer Eng	1,495	31.3%	19.2%
Electrical Eng	2,058	33.2%	19.4%
Environmental Eng	161	30.4%	26.1%
Industrial/Man Eng	163	31.3%	17.8%
Mechanical Eng	1,364	32.8%	19.5%
Indstr Mgt Sys Eng	147	35.4%	18.4%
Eng Tech	50	24.0%	28.0%

	Total	Underrepresented Minority	Female
Totals by School			
FAMU	2,314	95.9%	31.7%
FAU	2,902	32.7%	20.8%
FIU	4,549	68.4%	18.0%
FSU	4,162	25.4%	22.9%
UCF	8,190	19.7%	16.0%
UF	8,765	17.5%	19.0%
USF	4,633	20.7%	19.2%
FAMU			
All	2,314	95.9%	31.7%
Computer & Info Sci	256	94.1%	30.1%
Info Tech	20	100.0%	40.0%
Computer Info Sys	31	93.5%	29.0%
Eng General	0		
Biomedical Eng	3	100.0%	
Chemical Eng	42	100.0%	28.6%
Civil Eng	83	92.8%	24.1%
Computer Eng	84	94.0%	31.0%
Electrical Eng	112	99.1%	39.3%
Environmental Eng	11	100.0%	18.2%
Industrial/Man Eng	6	100.0%	16.7%
Mechanical Eng	90	97.8%	35.6%
Indstr Mgt Sys Eng	11	81.8%	36.4%
Eng Tech	4	100.0%	75.0%
FAU			
All	2,902	32.7%	20.8%
Computer & Info Sci	300	29.7%	21.7%
Info Tech	15	26.7%	13.3%
Computer Info Sys	59	37.3%	18.6%
Eng General	0		
Biomedical Eng	0		
Chemical Eng	62	45.2%	22.6%
Civil Eng	96	26.0%	29.2%
Computer Eng	139	28.1%	18.0%
Electrical Eng	187	31.0%	19.8%
Environmental Eng	9	44.4%	44.4%
Industrial/Man Eng	9	44.4%	33.3%
Mechanical Eng	92	45.7%	20.7%
Indstr Mgt Sys Eng	8	50.0%	12.5%
Eng Tech	1		

	Total	Underrepresented Minority	Female
FIU			
All	4,549	68.4%	18.0%
Computer & Info Sci	417	66.2%	18.9%
Info Tech	38	68.4%	13.2%
Computer Info Sys	76	57.9%	17.1%
Eng General	0		
Biomedical Eng	2	50.0%	
Chemical Eng	68	76.5%	14.7%
Civil Eng	189	70.9%	22.2%
Computer Eng	214	70.6%	19.2%
Electrical Eng	276	71.4%	17.8%
Environmental Eng	15	46.7%	6.7%
Industrial/Man Eng	20	75.0%	5.0%
Mechanical Eng	173	72.3%	17.3%
Indstr Mgt Sys Eng	24	75.0%	25.0%
Eng Tech	4	100.0%	
FSU			
All	4,162	25.4%	22.9%
Computer & Info Sci	378	28.6%	20.9%
Info Tech	38	28.9%	21.1%
Computer Info Sys	74	25.7%	16.2%
Eng General	0		
Biomedical Eng	1		
Chemical Eng	86	24.4%	18.6%
Civil Eng	152	24.3%	21.1%
Computer Eng	154	21.4%	21.4%
Electrical Eng	216	25.5%	22.2%
Environmental Eng	18	27.8%	33.3%
Industrial/Man Eng	22	27.3%	18.2%
Mechanical Eng	162	22.2%	19.1%
Indstr Mgt Sys Eng	18	50.0%	11.1%
Eng Tech	6	33.3%	33.3%
UCF			
All	8,190	19.7%	16.0%
Computer & Info Sci	724	17.8%	18.4%
Info Tech	53	15.1%	17.0%
Computer Info Sys	141	22.7%	15.6%
Eng General	0		
Biomedical Eng	1		
Chemical Eng	115	19.1%	13.0%
Civil Eng	321	13.7%	12.1%
Computer Eng	342	18.7%	18.7%

	Total	Underrepresented Minority	Female
Electrical Eng	463	23.1%	14.9%
Environmental Eng	41	24.4%	31.7%
Industrial/Man Eng	36	22.2%	19.4%
Mechanical Eng	308	20.8%	15.9%
Indstr Mgt Sys Eng	36	8.3%	19.4%
Eng Tech	13	15.4%	15.4%
UF			
All	8,765	17.5%	19.0%
Computer & Info Sci	762	17.7%	19.9%
Info Tech	70	20.0%	15.7%
Computer Info Sys	134	13.4%	10.4%
Eng General	1	100.0%	
Biomedical Eng	1		100.0%
Chemical Eng	165	16.4%	16.4%
Civil Eng	323	19.5%	18.9%
Computer Eng	373	16.9%	17.2%
Electrical Eng	502	18.7%	19.7%
Environmental Eng	47	17.0%	23.4%
Industrial/Man Eng	42	14.3%	23.8%
Mechanical Eng	361	18.0%	20.8%
Indstr Mgt Sys Eng	36	13.9%	11.1%
Eng Tech	15		33.3%
USF			
All	4,633	20.7%	19.2%
Computer & Info Sci	393	19.1%	22.9%
Info Tech	39	23.1%	12.8%
Computer Info Sys	60	21.7%	25.0%
Eng General	2	50.0%	
Biomedical Eng	0		
Chemical Eng	77	23.4%	19.5%
Civil Eng	171	21.6%	20.5%
Computer Eng	189	20.6%	18.0%
Electrical Eng	302	20.5%	17.9%
Environmental Eng	20	20.0%	25.0%
Industrial/Man Eng	28	21.4%	10.7%
Mechanical Eng	178	15.7%	16.9%
Indstr Mgt Sys Eng	14	28.6%	21.4%
Eng Tech	7		28.6%

Retention Summary

Error! Reference source not found. summarizes data from Tables 4, 6 and 7. For enrollment at major SUS Colleges of Engineering

- Black Students – FAMU, FSU and UF are largest, followed by USF.
- Hispanic students – FIU, UF and UCF have the greatest numbers.
- Females – All schools except FIU show substantial populations.

For entry versus graduation at major SUS Colleges of Engineering

- FTIC Black Students – Do comparatively well at FAMU and FSU, and comparatively poorly at FIU, UF and USF. CCTs do comparatively well at FAMU and UF, and comparatively poorly at FIU, UCF and USF.
- FTIC Hispanic students – Show only small differences from institution to institution. Frequently, larger differences associate with smaller representation. Only USF shows negative, and positives range from 4% to 11%. CCTs show similar results, with all being positive, ranging from 5% at FIU to 13% at USF.
- FTIC Females do better at all schools, although they do least well at UF and best at USF. Other schools showing about a 20% gain for females are FIU, FSU and UCF. CCT females show percentages around zero at all schools expect UCF and FSU.

At the Discipline Level – Representation in Major Disciplines Only (FTIC & CCT)

Engineering and Computer Sciences wide, FAMU has the greatest underrepresented and female populations (96%, 32%). FIU has the second greatest underrepresented at 68%, but the second lowest female at 18%. Among other schools, only FSU shows somewhat higher representation among underrepresented minorities (25%) and females (23%). UCF has the lowest female representation (16%) while UF has the lowest underrepresented percentages (18%).

At the discipline level, for FAMU, only Computer and Information Science has more than 120 students. It also appears to reflect the typical FAMU representation among minorities and females. FIU is heavily minority across all major disciplines, and low in females, even in Computer and Information sciences. FSU also has fairly consistent representation across the major disciplines, with one exception being Computer Engineering at 21% underrepresented minority. UCF shows one of the more interesting distributions, having lower than average minority representation in Computer and Information sciences and substantially lower in Civil, with a higher than normal underrepresented presence in Electrical and Mechanical. Regarding females, Computer and Information sciences is higher, with Civil, Chemical, and to a lesser extent Electrical showing low representation. Civil Engineering might be interesting at UCF due to the lack of female and minority representation. At UF, all of the major disciplines exhibit somewhat higher than institutional average minority representation. Female representation is also fairly consistent, with only Chemical Engineering showing shortages both among minorities and females. USF is also consistent, with only Mechanical Engineering (16%) showing low representation both for minorities and females.

Table 8
Retention and Enrollment Summary

	FAMU		FIU		UF		UCF		USF		FSU	
	Enrolled Numbers from Table 4– 1996-97 to 1998-99											
Blacks	412		24		79		44		26		124	
Hispanic	3		187		210		87		45		51	
Female	254		67		410		113		90		156	
	Entry versus Graduation Percentages from Table 6 – 1996-97 to 1998-99											
FTIC												
Blacks	1%		-41%		-18%		-6%		-34%		5%	
Hispanic	--		4%		11%		4%		-5%		9%	
Female	12%		22%		4%		19%		31%		18%	
CCT												
Blacks	6%		-16%		3%		-18%		-25%		-2%	
Hispanic	--		5%		7%		6%		13%		--	
Female	-2%		-3%		-1%		7%		-1%		15%	
	FAMU		FIU		UF		UCF		USF		FSU	
Underrepresented & Female Percents by Discipline from Table 7 – 1996-97 to 2003-04												
	Und*	Fm	Und	Fm	Und	Fm	Und	Fm	Und	Fm	Und	Fm
All	96%	32%	68%	18%	18%	19%	20%	16%	21%	19%	25%	23%
Info Sci	94%	30%	66%	19%	18%	20%	18%	18%	19%	23%	29%	21%
EE	99%	39%	71%	18%	19%	20%	23%	15%	21%	18%	26%	22%
Comp Eng	94%	31%	71%	19%	17%	17%	19%	19%	21%	18%	21%	21%
Mechanical	98%	36%	72%	17%	18%	21%	21%	16%	16%	17%		
Civil	93%	24%	71%	22%	20%	19%	14%	12%	22%	21%	24%	21%
Chemical			77%	15%	16%	16%	19%	13%	23%	20%	24%	19%

- Only School having near 50 enrollees during the eight cohort period

Community College Analyses

Sampling Additions

Because CCTs generally require less time to complete a degree from entry to the 4-year institution, two additional cohorts were added to the sample (1999-00, 2000-01). This resulted in a total sample of 92,157 students, of whom 8,520 majored in Engineering with another 7,402 majoring in the natural sciences.

The data in Table 9 are sorted by engineering student graduation rates, not necessarily in the field noted (these are enrollees disciplines, not degree disciplines). Overall, 57% of Natural Sciences students graduated within a four year period of matriculation in the SUS (2000-01 to 2004-05), 63% of Engineering students and 73% of students in other disciplines. Miami-Dade (63%) had the overall lowest graduation rates with Okaloosa-Walton (84%) having the highest. The graduation rates among Engineering students from the various community colleges range from 89% (Chipola) to 35% for Pasco-Hernando. Note that although only 35% of Pasco-Hernando's Engineering majors graduate, 71% of students in other disciplines graduate. Comparing the performance of students from various schools within a region (e.g. USF's Region), shows some interesting differences. While 65% of St. Petersburg College, 63% of Polk, 61% of Hillsborough CC, and 58% of Manatee CC Engineering students graduate, only 35% of such students from Pasco-Hernando graduate. Because most CCTs enroll in the nearest institution having their desired programs, most of the students noted will have enrolled in USF's College of Engineering, thus, the gap between Pasco-Hernando and the other four USF source schools is quite interesting.

Another point to note regarding these data is that some schools send a comparatively high percentage of their SUS enrollees to Engineering (e.g. Fla CC at Jacksonville, 18%), while others send comparative few (e.g. Manatee, 7%).

Table 9
CCTs by College, Program Area and Degree Attained – 1996-97 to 2000-01

	All		Engineering		Natural Sci		Other	
	N	Grad	N	Grad	N	Grad	N	Grad
Totals	92,157	71%	8,520	63%	7,402	57%	76,235	73%
Chipola	611	82%	62	89%	38	68%	511	82%
Lake City	356	80%	43	86%	19	63%	294	80%
Fla CC At Jack	1,366	80%	191	81%	107	77%	1,068	80%
Santa Fe	6,471	82%	626	80%	288	70%	5,557	83%
St Johns River	482	76%	41	78%	46	61%	395	77%
Okaloosa-Walton	697	84%	90	77%	49	82%	558	85%
Gulf Coast	1,384	80%	108	75%	62	73%	1,214	80%
Central Fla	1,380	76%	136	74%	92	60%	1,152	78%
North Florida	292	75%	23	74%	10	70%	259	75%
Tallahassee	5,720	76%	466	69%	221	56%	5,033	77%
Pensacola	598	75%	80	66%	38	63%	480	77%
Indian River	2,277	74%	147	65%	207	69%	1,923	76%
St Petersburg	6,968	71%	536	65%	482	62%	5,950	72%

	All		Engineering		Natural Sci		Other	
	N	Grad	N	Grad	N	Grad	N	Grad
Edison	1,932	73%	178	64%	229	62%	1,525	75%
Polk	1,505	70%	125	63%	89	56%	1,291	72%
Lake Sumter	658	78%	46	63%	46	59%	566	81%
Daytona Bch	3,258	73%	233	62%	337	55%	2,688	76%
Palm Beach	6,227	68%	518	62%	565	55%	5,144	70%
Seminole	2,553	70%	228	61%	264	63%	2,061	71%
Hillsborough	5,689	66%	465	61%	424	52%	4,800	68%
Broward	8,123	69%	724	59%	623	55%	6,776	72%
Valencia	11,406	70%	1,186	59%	1,246	58%	8,974	73%
Manatee	2,781	73%	169	58%	218	63%	2,394	75%
Miami-Dade	12,620	63%	1,445	54%	1,050	44%	10,125	67%
Brevard	4,875	71%	551	53%	474	59%	3,850	75%
Florida Keys	167	71%	8	50%	17	65%	142	73%
South Florida	465	72%	39	44%	32	56%	394	76%
Pasco-Hernando	1,242	68%	54	35%	120	53%	1,068	71%
Not Considered								
Non-Fla	32	69%	2	100%	5	20%	25	76%

Table 10 displays the race/ethnicity/sex of students from the several community colleges with numbers and graduation rates in engineering programs. Few of the community colleges contribute large numbers of either underrepresented minority or female Engineering students to the SUS. Over the five year period, Miami-Dade contributed 1,057 Black or Hispanic Engineering students. Valencia and Broward both contributed about 250, while Palm Beach, Tallahassee and Hillsborough contributed about 100. Santa Fe and Brevard contributed respectively 74 and 54, with none other adding more than 36 (St. Petersburg). The highest combined graduation rates for Hispanic and Black students, among the major contributors were Santa Fe (77%), Broward (62%) and Brevard (61%). Among institutions contributing at least 54 Engineering students, graduation rates were respectively, Valencia (52%), Hillsborough & Palm Beach (54%), Miami-Dade (55%), Tallahassee (55%), Brevard (61%), Broward (62%) and Santa Fe (77%). Regarding Santa Fe's high statistic, we must note that most of these would attend UF's College of Engineering, and UF only accepts CCTs who are already accepted into one of their limited access degree programs. Thus, this is a select sample of CCTs who enroll at UF. Graduation rates for Black students range from 74% from Santa Fe, to 45% at Palm Beach. Miami-Dade (49%), Brevard (48%), Hillsborough (51%) and Valencia (52%) also have lower to moderate graduation rates. From there it leaps to 57% for Tallahassee, 60% for Broward and 74% for Santa Fe. Among the larger contributors, Black students make up between 5% (Santa Fe) and 19% (Miami-Dade) of the source population (those who attend an SUS institution). Most have between 10% and 18%, with only Brevard and Santa Fe lower (5-6%). Among Hispanics, Miami-Dade is 57% while Tallahassee is 5%. Most are between 11% and 16% with only Santa Fe, Brevard and Tallahassee below that.

Table 10
Sex, Race/Ethnicity and Graduation Rates for Engineering Majors by College – 1996-97 to 2000-01

					Engineering Student Graduation Rates					
	Total	Percent of Population			Black		Hispanic		Female	
		Black	Hispanic	Female	N	Grad	N	Grad	N	Grad
All	92,148	10%	15%	58%	835	53%	1,406	59%	1,798	64%
Brevard	4,875	6%	6%	59%	25	48%	29	72%	119	53%
Central Fla	1,379	7%	4%	56%	10	50%	6	83%	29	72%
Chipola	611	15%	1%	60%	4	75%	1	100%	17	88%
Daytona Bch	3,258	6%	5%	63%	11	45%	13	69%	38	37%
Edison	1,932	5%	7%	56%	5	80%	10	70%	36	61%
Fla CC at Jacks	1,366	14%	4%	51%	16	56%	6	83%	36	83%
Florida Keys	167	5%	19%	66%	0		1	100%	2	100%
Gulf Coast	1,384	6%	3%	61%	10	50%	3	67%	19	58%
Indian River	2,277	8%	5%	62%	9	33%	9	44%	31	65%
Broward	8,122	18%	16%	63%	116	60%	131	64%	179	59%
Lake City	356	8%	2%	56%	3	67%	2	100%	9	100%
Lake Sumter	658	5%	4%	63%	1	100%	3	100%	5	60%
Manatee	2,781	4%	4%	62%	1	0%	7	57%	28	71%
Miami-Dade	12,619	19%	57%	56%	270	49%	787	57%	294	55%
North Florida	292	12%	2%	60%	3	100%	0		7	86%
Okaloosa-Walton	697	4%	3%	49%	2	50%	6	100%	15	67%
Palm Beach	6,227	11%	11%	60%	60	45%	52	65%	132	59%
Pensacola	598	10%	4%	52%	7	57%	2	100%	16	75%
Polk	1,505	10%	5%	61%	5	40%	4	50%	20	80%
Santa Fe	6,471	5%	8%	48%	23	74%	51	78%	87	76%
Seminole	2,553	7%	9%	57%	10	60%	25	60%	43	70%
South Florida	465	5%	7%	60%	3	67%	2	0%	8	50%
St Johns River	482	4%	3%	52%	1	0%	0		6	67%
St Petersburg	6,965	6%	4%	60%	17	41%	19	58%	120	64%
Tallahassee	5,720	16%	5%	51%	82	57%	19	63%	131	76%
Valencia	11,406	9%	15%	57%	94	52%	162	52%	256	66%
Hillsborough	5,686	11%	13%	58%	47	51%	54	57%	106	67%
Pasco-Hernando	1,242	2%	7%	64%	0		2	100%	9	44%

Regarding female representation in Engineering, every one of the previously considered community colleges contributed at least 106 students (Hillsborough) during the time considered except Santa Fe (87). Female graduation rates ranged considerable, from 53% at Brevard, to 55% from Miami-Dade, to 59% at Palm Beach and Broward, to 66-67% at Hillsborough and Valencia, and to 76% from Tallahassee and Santa Fe.

To better compare institutions, they will be ranked into four categories ranging from High, Mid and Low for each of the measures of interest. Looked at in this way, the only community college falling in the High range on graduation is Santa Fe, which falls low in all representations (percentages of population) Tallahassee, Santa Fe and Broward show High Black graduation, Santa Fe and Brevard show High Hispanic graduation, and female graduation is quite high everywhere (Mid = 55% or higher), except from Miami-Dade and Brevard.

Table 11
Category Rankings for Variables of Interest and Numbers of Engineering Students

	N		Percentages of Population			Graduation Rates		
	Minority	Female	Black	Hispanic	Female	Black	Hispanic	Female
Santa Fe	74	87	Low	Low	Low	High	High	High
Tallahassee	101	131	High	Low	Low	High	Mid	High
Hillsborough	101	106	Mid	Mid	Mid	Mid	Low	Mid
Valencia	256	256	Mid	High	Mid	Mid	Low	Mid
Palm Beach	112	132	Mid	Mid	High	Low	Mid	Mid
Broward	247	179	High	High	High	High	Mid	Mid
Miami-Dade	1,057	294	High	High	Mid	Low	Low	Low
Brevard	54	119	Low	Low	High	Low	High	Low

Appendix A – Detail Tables

Note that the data in Table 12 should be indexed based on typical graduation percentages at the different institutions, This is particularly important when comparing any institution to UF, because UF has large percentage of AP and IB students, and is the nations leader in National Merit Scholars, etc. Due to this, their expected graduation rates are high, as are those of FSU. Table 12 shows the numbers and percentages of undergraduate Engineering students at the major SUS institutions by race/ethnicity and sex, and what percentage graduated, separately for all undergraduate students, for FTIC and CCTs. The top section of the table shows that overall, women (68%) do better than men (60%). This effect is strong for FTIC (68% to 58%), however, is fairly minor among CCTs (66% to 64%). Among racial/ethnic groups, overall, Asians (72%) had the highest graduation rate, while Blacks (52%) had the lowest. This held true for FTIC (70% to 51%, with Others also at 51%), and CCT students (75% to 55%). Overall, Hispanics (59%) fell slightly behind others (61% and whites (64%). For FTIC students, Hispanic students (57%) did better than both Black and Other students (51%). Among CCT students, Hispanic students (62%) were very close to whites (64%), while other students showed the second highest overall graduation rates (70%).

Table 12
Graduation Rates for Engineering Students by Institution, Race/ethnicity and Sex

	Total	Asian	Black	Hispanic	Other	White	Female	Male
Both FTIC and CCTs								
Total	12,145	1,045	1,917	1,920	668	6,595	2,568	9,577
FAMU	888	6	842	6	16	18	316	572
FAU	1,100	104	157	147	116	576	259	841
FIU	1,631	105	234	892	157	243	299	1,332
FSU	1,267	66	223	89	43	846	290	977
UCF	2,634	246	173	306	143	1,766	454	2,180
UF	3,153	337	158	334	102	2,222	634	2,519
USF	1,472	181	130	146	91	924	316	1,156
Percent Graduated								
Total	62%	72%	52%	59%	61%	64%	68%	60%
FAMU	55%	67%	56%	67%	31%	50%	62%	51%
FAU	52%	65%	40%	56%	64%	50%	56%	51%
FIU	49%	59%	38%	52%	57%	41%	55%	48%
FSU	69%	71%	66%	63%	67%	70%	76%	67%
UCF	53%	69%	51%	54%	55%	51%	61%	52%
UF	83%	85%	68%	87%	77%	83%	85%	82%
USF	52%	66%	33%	53%	60%	51%	60%	50%
FTIC								
Total	7,030	571	1,419	1,054	304	3,682	1,531	5,499
FAMU	803	1	776	3	15	8	287	516
FAU	432	42	64	53	41	232	79	353
FIU	766	59	95	418	94	100	127	639

	Total	Asian	Black	Hispanic	Other	White	Female	Male
FSU	892	53	180	71	34	554	201	691
UCF	1,192	83	94	167	41	807	191	1,001
UF	2,145	246	121	236	31	1,511	491	1,654
USF	800	87	89	106	48	470	155	645
Percent Graduated								
Total	60%	70%	51%	57%	51%	63%	68%	58%
FAMU	54%	0%	54%	100%	33%	38%	61%	50%
FAU	42%	52%	30%	47%	63%	39%	51%	41%
FIU	44%	59%	24%	47%	49%	39%	47%	44%
FSU	65%	72%	64%	63%	68%	65%	74%	63%
UCF	50%	64%	52%	51%	34%	49%	62%	47%
UF	81%	83%	62%	86%	65%	81%	85%	80%
USF	44%	56%	28%	43%	42%	45%	56%	41%
CCT								
Total	5,115	474	498	866	364	2,913	1,037	4,078
FAMU	85	5	66	3	1	10	29	56
FAU	668	62	93	94	75	344	180	488
FIU	865	46	139	474	63	143	172	693
FSU	375	13	43	18	9	292	89	286
UCF	1,442	163	79	139	102	959	263	1,179
UF	1,008	91	37	98	71	711	143	865
USF	672	94	41	40	43	454	161	511
Percent Graduated								
Total	64%	75%	55%	62%	70%	64%	66%	64%
FAMU	67%	80%	70%	33%	0%	60%	76%	63%
FAU	59%	74%	47%	62%	64%	57%	59%	59%
FIU	54%	59%	47%	57%	68%	42%	60%	52%
FSU	77%	69%	72%	61%	67%	80%	81%	76%
UCF	56%	72%	49%	58%	64%	53%	59%	55%
UF	87%	90%	86%	88%	83%	86%	87%	87%
USF	61%	76%	44%	78%	81%	57%	64%	60%

Table 13 shows the number of cases in each cell of Table 7, in addition to the other statistics presented there. Note that Engineering Tech is generally located at the smaller engineering institutions, rather than these major ones.

Table 13
Totals by Discipline for SUS Institutions – 1996-97 to 2003-04

				Over Represented Groups		Under Represented Minorities	
	Total	Under	Female	Female	Male	Female	Male
Totals by Discipline							
All	35,515	32.2%	19.6%	4286	19788	2689	8752
Computer & Info Sci	3,230	32.6%	20.9%	420	1757	255	798
Info Tech	273	33.7%	17.6%	28	153	20	72
Computer Info Sys	575	30.8%	16.7%	57	341	39	138
Biomedical Eng	8	50.0%	12.5%	1	3		4
Chemical Eng	615	34.1%	17.7%	64	341	45	165
Civil Eng	1,335	31.2%	19.3%	148	770	109	308
Computer Eng	1,495	31.3%	19.2%	172	855	115	353
Electrical Eng	2,058	33.2%	19.4%	248	1126	152	532
Environmental Eng	161	30.4%	26.1%	30	82	12	37
Industrial/Man Eng	163	31.3%	17.8%	20	92	9	42
Mechanical Eng	1,364	32.8%	19.5%	162	754	104	344
Indstr Mgt Sys Eng	147	35.4%	18.4%	16	79	11	41
Eng Tech	50	24.0%	28.0%	11	27	3	9
Totals by School							
FAMU	2,314	95.9%	31.7%	15	81	719	1,499
FAU	2,902	32.7%	20.8%	382	1,570	223	727
FIU	4,549	68.4%	18.0%	269	1,170	549	2,561
FSU	4,162	25.4%	22.9%	674	2,430	280	778
UCF	8,190	19.7%	16.0%	998	5,582	312	1,298
UF	8,765	17.5%	19.0%	1,292	5,935	373	1,165

				Over Represented Groups		Under Represented Minorities	
	Total	Under	Female	Female	Male	Female	Male
USF	4,633	20.7%	19.2%	656	3,020	233	724
FAMU							
All	2,314	95.9%	31.7%	15	81	719	1499
Computer & Info Sci	256	94.1%	30.1%	2	13	75	166
Info Tech	20	100.0%	40.0%			8	12
Computer Info Sys	31	93.5%	29.0%		2	9	20
Biomedical Eng	3	100.0%					3
Chemical Eng	42	100.0%	28.6%			12	30
Civil Eng	83	92.8%	24.1%	1	5	19	58
Computer Eng	84	94.0%	31.0%	1	4	25	54
Electrical Eng	112	99.1%	39.3%		1	44	67
Environmental Eng	11	100.0%	18.2%			2	9
Industrial/Man Eng	6	100.0%	16.7%			1	5
Mechanical Eng	90	97.8%	35.6%	2		30	58
Indstr Mgt Sys Eng	11	81.8%	36.4%		2	4	5
Eng Tech	4	100.0%	75.0%			3	1
FAU							
All	2,902	32.7%	20.8%	382	1570	223	727
Computer & Info Sci	300	29.7%	21.7%	43	168	22	67
Info Tech	15	26.7%	13.3%	2	9		4
Computer Info Sys	59	37.3%	18.6%	5	32	6	16
Biomedical Eng	0						
Chemical Eng	62	45.2%	22.6%	8	26	6	22
Civil Eng	96	26.0%	29.2%	19	52	9	16
Computer Eng	139	28.1%	18.0%	17	83	8	31

				Over Represented Groups		Under Represented Minorities	
	Total	Under	Female	Female	Male	Female	Male
Electrical Eng	187	31.0%	19.8%	27	102	10	48
Environmental Eng	9	44.4%	44.4%	3	2	1	3
Industrial/Man Eng	9	44.4%	33.3%	1	4	2	2
Mechanical Eng	92	45.7%	20.7%	8	42	11	31
Indstr Mgt Sys Eng	8	50.0%	12.5%		4	1	3
Eng Tech	1				1		
FIU							
All	4,549	68.4%	18.0%	269	1170	549	2561
Computer & Info Sci	417	66.2%	18.9%	26	115	53	223
Info Tech	38	68.4%	13.2%	1	11	4	22
Computer Info Sys	76	57.9%	17.1%	7	25	6	38
Biomedical Eng	2	50.0%			1		1
Chemical Eng	68	76.5%	14.7%	2	14	8	44
Civil Eng	189	70.9%	22.2%	9	46	33	101
Computer Eng	214	70.6%	19.2%	12	51	29	122
Electrical Eng	276	71.4%	17.8%	20	59	29	168
Environmental Eng	15	46.7%	6.7%	1	7		7
Industrial/Man Eng	20	75.0%	5.0%		5	1	14
Mechanical Eng	173	72.3%	17.3%	10	38	20	105
Indstr Mgt Sys Eng	24	75.0%	25.0%	3	3	3	15
Eng Tech	4	100.0%					4
FSU							
All	4,162	25.4%	22.9%	674	2430	280	778
Computer & Info Sci	378	28.6%	20.9%	54	216	25	83
Info Tech	38	28.9%	21.1%	4	23	4	7

				Over Represented Groups		Under Represented Minorities	
	Total	Under	Female	Female	Male	Female	Male
Computer Info Sys	74	25.7%	16.2%	7	48	5	14
Biomedical Eng	1				1		
Chemical Eng	86	24.4%	18.6%	10	55	6	15
Civil Eng	152	24.3%	21.1%	29	86	3	34
Computer Eng	154	21.4%	21.4%	25	96	8	25
Electrical Eng	216	25.5%	22.2%	35	126	13	42
Environmental Eng	18	27.8%	33.3%	3	10	3	2
Industrial/Man Eng	22	27.3%	18.2%	3	13	1	5
Mechanical Eng	162	22.2%	19.1%	19	107	12	24
Indstr Mgt Sys Eng	18	50.0%	11.1%	1	8	1	8
Eng Tech	6	33.3%	33.3%	2	2		2
UCF							
All	8,190	19.7%	16.0%	998	5582	312	1298
Computer & Info Sci	724	17.8%	18.4%	108	487	25	104
Info Tech	53	15.1%	17.0%	7	38	2	6
Computer Info Sys	141	22.7%	15.6%	16	93	6	26
Biomedical Eng	1				1		
Chemical Eng	115	19.1%	13.0%	12	81	3	19
Civil Eng	321	13.7%	12.1%	28	249	11	33
Computer Eng	342	18.7%	18.7%	42	236	22	42
Electrical Eng	463	23.1%	14.9%	53	303	16	91
Environmental Eng	41	24.4%	31.7%	9	22	4	6
Industrial/Man Eng	36	22.2%	19.4%	5	23	2	6
Mechanical Eng	308	20.8%	15.9%	39	205	10	54
Indstr Mgt Sys Eng	36	8.3%	19.4%	6	27	1	2
Eng Tech	13	15.4%	15.4%	2	9		2

				Over Represented Groups		Under Represented Minorities	
	Total	Under	Female	Female	Male	Female	Male
UF							
All	8,765	17.5%	19.0%	1292	5935	373	1165
Computer & Info Sci	762	17.7%	19.9%	116	511	36	99
Info Tech	70	20.0%	15.7%	11	45		14
Computer Info Sys	134	13.4%	10.4%	11	105	3	15
Biomedical Eng	1		100.0%	1			
Chemical Eng	165	16.4%	16.4%	20	118	7	20
Civil Eng	323	19.5%	18.9%	42	218	19	44
Computer Eng	373	16.9%	17.2%	51	259	13	50
Electrical Eng	502	18.7%	19.7%	78	330	21	73
Environmental Eng	47	17.0%	23.4%	9	30	2	6
Industrial/Man Eng	42	14.3%	23.8%	9	27	1	5
Mechanical Eng	361	18.0%	20.8%	60	236	15	50
Indstr Mgt Sys Eng	36	13.9%	11.1%	4	27		5
Eng Tech	15		33.3%	5	10		
USF							
All	4,633	20.7%	19.2%	656	3020	233	724
Computer & Info Sci	393	19.1%	22.9%	71	247	19	56
Info Tech	39	23.1%	12.8%	3	27	2	7
Computer Info Sys	60	21.7%	25.0%	11	36	4	9
Biomedical Eng	0						
Chemical Eng	77	23.4%	19.5%	12	47	3	15
Civil Eng	171	21.6%	20.5%	20	114	15	22
Computer Eng	189	20.6%	18.0%	24	126	10	29
Electrical Eng	302	20.5%	17.9%	35	205	19	43

				Over Represented Groups		Under Represented Minorities	
	Total	Under	Female	Female	Male	Female	Male
Environmental Eng	20	20.0%	25.0%	5	11		4
Industrial/Man Eng	28	21.4%	10.7%	2	20	1	5
Mechanical Eng	178	15.7%	16.9%	24	126	6	22
Indstr Mgt Sys Eng	14	28.6%	21.4%	2	8	1	3
Eng Tech	7		28.6%	2	5		