

# A Comparative Study of Grade Inflation and Academic Standards for Various Departments at Salt Lake Community College

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## Abstract

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A recent study of grade inflation and academic standards for several two-year programs at Salt Lake Community College from 1993 to 1999 was performed. Four two-year programs, i.e., Engineering, Mathematics, Computer Science, and Family and Human Studies were considered and compared for this study. Grade point averages for each of the four departments were compared and analyzed. The results indicate no grade inflation for any of the four disciplines.

A slight reduction in grade point average was observed for all departments from 1993 to 1999. The grade distribution among the four departments was very dissimilar. Engineering and mathematics maintained a similar trend in the distribution of grades. In engineering, approximately twenty-seven percent of the grades given were A 's, while 20 percent of the students failed. A-, B+, B, B-, C+, and C grades represented the remaining 53 percent. Mathematics department awarded approximately 20 percent A grades and had a 24 percent failing grades. This research indicates that the academic standards for engineering and mathematics departments were not compromised over the period from 1993 to 1999.

In Computer Science, 28 percent of the grades given were A 's, while 15 percent of the students failed. A-, B+, B, B-, C+, and C grades represented the remaining 57 percent. The largest distribution of grades occurred in Family and Human Studies. For 1993 and 1996, more than 40 percent of the students received A 's, while only 10 percent of the students failed. A-, B+, B, B-, C+, and C grades represented the remaining 50 percent. The A 's awarded in 1999 decreased to 25 percent while the failing grades increased to 19 percent.

The trends in grade distribution for all departments seem similar. Very little change occurred in Engineering and Mathematics, between 1993 and 1999. The Computer Science failure rate increased from 12 percent in 1993 to 22 percent in 1999. The number of A 's given in the Family and Human Studies Department decreased from approximately 40 percent to 25 percent during the same time frame.

Considering all four programs, the number of A 's remained nearly the same (24 percent in 1993 and 22 percent in 1999), while the student failure rate increased from (17 percent in 1993, to 27 percent in 1999.) It was concluded that grade inflation is not the major concern many feared it to be, in these four programs at Salt Lake Community College. Academic standards are a direct result of the grades awarded in each program. This study on grade inflation shows that the academic standards in the four departments at Salt Lake Community College have not been compromised.

## I. Background Information

Salt Lake Community College (SLCC) is a large metropolitan community college, surrounded by rural communities, with an overall budget of nearly \$70,000,000 per year. SLCC consists of four campuses, and five teaching centers, for a total of nine locations within the Salt Lake City, Utah area. There are approximately 12,000 full-time equivalent (FTE) students, and 25,000 actual student head count. This number includes approximately 3,200 skill center students. Students attending SLCC take credit courses as well as non-credit courses. Students complete Associate of Engineering Degrees, Associate of Science Degrees, Associate of Applied Science Degrees, diplomas, and certificates in a variety of specialty areas. The majority of our students complete transfer programs and continue their educational studies at four year colleges and universities, while some complete their education at SLCC and go directly into their chosen profession.

The Engineering Departments at SLCC enjoy one of the best articulation agreements with the outstanding universities within the State. Students beginning their engineering education at SLCC can transfer with no loss of credit, to complete their education. All SLCC departments, including those in this study, enjoy articulation agreements, with four-year colleges and universities within the State of Utah.

## II. Introduction

For the past several years, there has been concern throughout the State of Utah, regarding grade inflation within the educational community. These concerns involve both the number of high grades given and the relatively few grades given to students who will not pass. Some controversy exists between rigorous academic programs and social science programs. To analyze this problem, we decided to investigate the grades given in four areas at SLCC. These four areas include Computer Science, Engineering, Family and Human Studies, and Mathematics Departments. We specifically selected these areas to compare differences, if they exist. To verify any changes that occurred chronologically, we elected to study these groups during fall semester in 1993, 1996, and 1999. Fall Semester was selected because it has the largest enrollment and the largest variety of courses.

## III. Procedure

Grades from every class, including multiple sections, taught in these four departments, i.e. Computer Science, Engineering, Family and Human Studies, and Mathematics, were examined for 1993, 1996, and 1999 fall semesters. The grade point averages (GPA 's) were calculated for each department. The number of A, A-, B+, B, B-, C+, and C grades were tabulated for each class, and summarized for each department. Percentages of increase/decrease were calculated and evaluated. Charts and tables were constructed to aid in the analyses of this data. This data was analyzed to verify whether or not grade inflation exists, and if there is a differential in grade inflation between the four departments. This data was also used to determine and compare academic standards between these departments.

#### IV. Results

To analyze and clarify the results of our research, we have presented the data in both tabular and graphic forms.

- A. The average GPA for each department for the years 1993, 1996, and 1999 are presented in Exhibit 1 and Table 1.

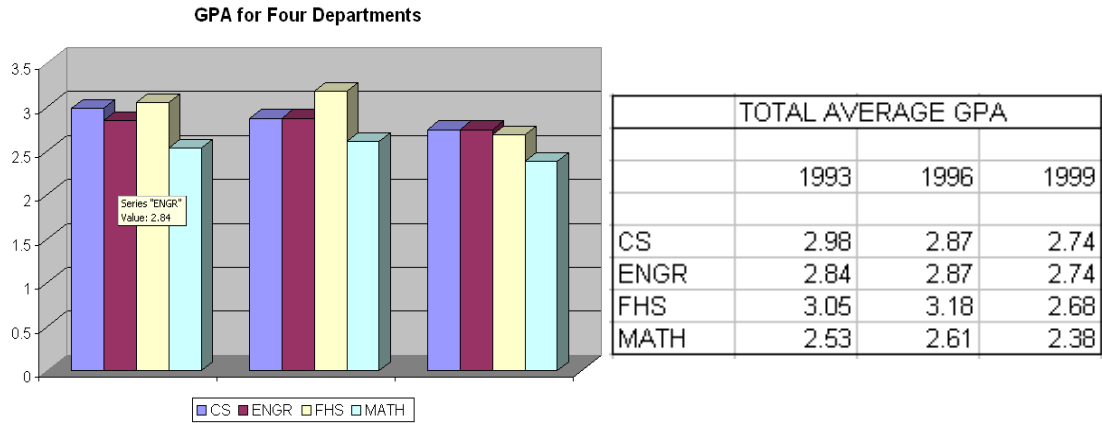


Exhibit 1 & Table 1: The average Grade Point Average for each department for 1993,1996 & 1999

- B. The distribution of grades for each department are presented in Exhibits 2, 3, 4, and 5, and Tables 2, 3, 4 and 5 for the years 1993, 1996, and 1999.

COMPUTER SCIENCE 1993 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
1228	324	154	126	234	89	58	90	32	9	42	16	54	
COMPUTER SCIENCE 1996 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
1530	419	189	176	199	113	68	104	54	20	44	21	124	
COMPUTER SCIENCE 1999 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
1181	335	154	114	158	58	29	75	37	12	16	9	185	

Table 2: Grade distributions for Computer Science Department

ENGINEERING 1993 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
331	92	36	24	42	28	24	30	15	6	6	6	22	
ENGINEERING 1996 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
301	93	28	38	41	16	11	13	16	6	6	5	28	
ENGINEERING 1999 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
282	74	46	21	30	22	12	21	4	0	11	2	39	

Table 3: Grade distributions for Engineering Science Department

F H S 1993 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
268	105	16	16	55	4	4	40	5	0	12	0	11	
F H S 1996 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
335	140	26	31	61	11	4	29	7	5	7	1	13	
F H S 1999 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
537	131	38	37	124	20	8	79	7	3	32	2	56	

Table 4: Grade distributions for Family and Human Studies Department

MATH 1993 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
1962	367	130	138	343	124	118	298	75	40	140	20	179	
MATH 1996 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
2408	501	202	194	391	186	141	257	83	48	138	49	221	
MATH 1999 SUMMARY													
TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	
3214	598	212	266	420	236	165	422	91	60	204	44	573	

Table 5: Grade distributions for Mathematics Department

C. The percentage of increase/decrease of A grades awarded in each department are

presented in Exhibits 6 and 7 and Tables 6 and 7 for the same years.

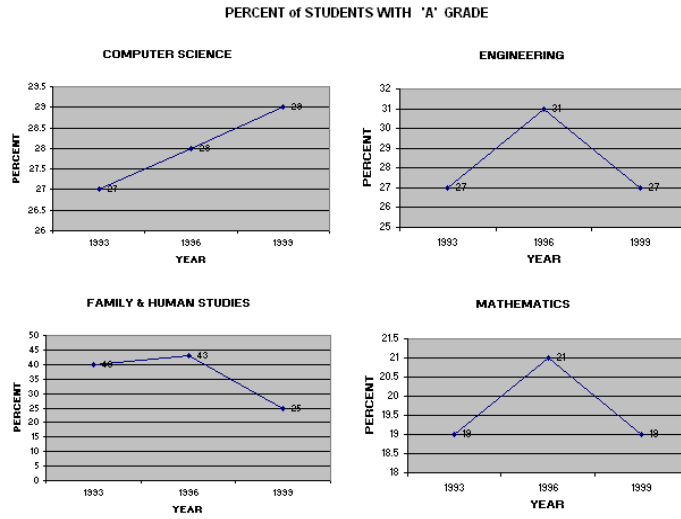


Exhibit 6: The A grades awarded in 1993, 1996 and 1999

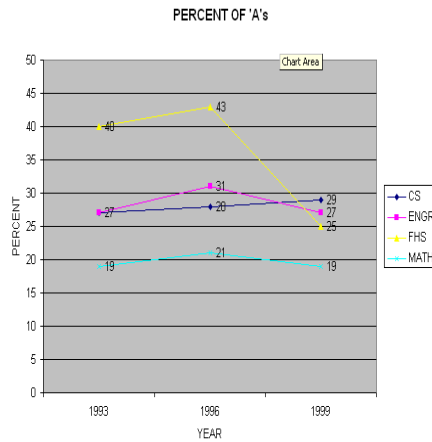


Exhibit 7: The percentages of A grades in the four departments

PERCENT OF STUDENTS WITH 'A' GRADE			
	1993	1996	1999
CS	27	28	29
ENGR	27	31	27
FHS	40	43	25
MATH	19	21	19

Tables 6 & 7: The A grades awarded for 1993, 1996 and 1999 in the four departments

D. The percentage of increase/decrease of passing grades awarded in each department are presented in Exhibit 8 and Table 8.

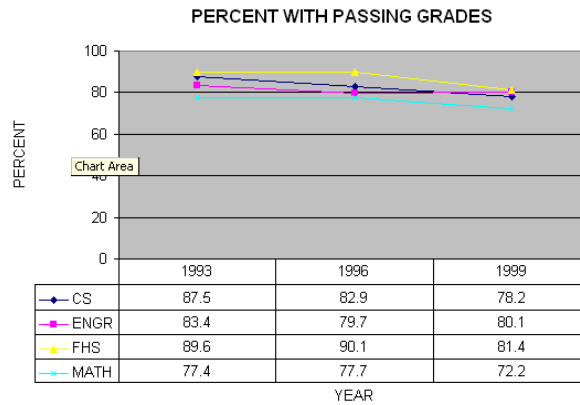


Exhibit 8 & Table 8: The percentages of passing grades awarded for 1993, 1996, and 1999

E. The distribution of grades when combining all four departments for 1993, 1996 and 1999 are presented in Exhibit 9 and Table 9.

GRADE DISTRIBUTION for 1993													
	TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
ECD	268	105	16	16	55	4	4	40	5	0	12	0	11
ENGR	331	92	36	24	42	28	24	30	15	6	6	6	22
MATH	1962	367	130	138	343	124	118	298	75	40	140	20	179
CS	1228	324	154	126	234	89	58	90	32	9	42	16	54
TOTALS	3786	886	336	304	673	245	204	458	127	55	200	42	266

GRADE DISTRIBUTION for 1996													
	TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
ECD	335	140	26	31	61	11	4	29	7	5	7	1	13
ENGR	301	93	28	38	41	16	11	13	16	6	6	5	28
MATH	2408	501	202	194	391	186	141	257	83	48	138	49	221
CS	1530	419	189	176	199	113	68	104	54	20	44	21	124
TOTALS	4574	1153	445	439	692	326	224	403	160	79	195	76	386

GRADE DISTRIBUTION for 1999													
	TOTAL STUDENTS	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
ECD	537	131	38	37	124	20	8	79	7	3	32	2	56
ENGR	282	74	46	21	30	22	12	21	4	0	11	2	39
MATH	3214	598	212	266	420	236	165	422	91	60	204	44	573
CS	1181	335	154	114	158	58	29	75	37	12	16	9	185
TOTALS	5012	1147	438	432	669	327	210	547	139	77	238	56	810

Table 9: The grade distributions for all departments for 1993, 1996 and 1999

## COMPUTER SCIENCE GRADE DISTRIBUTIONS

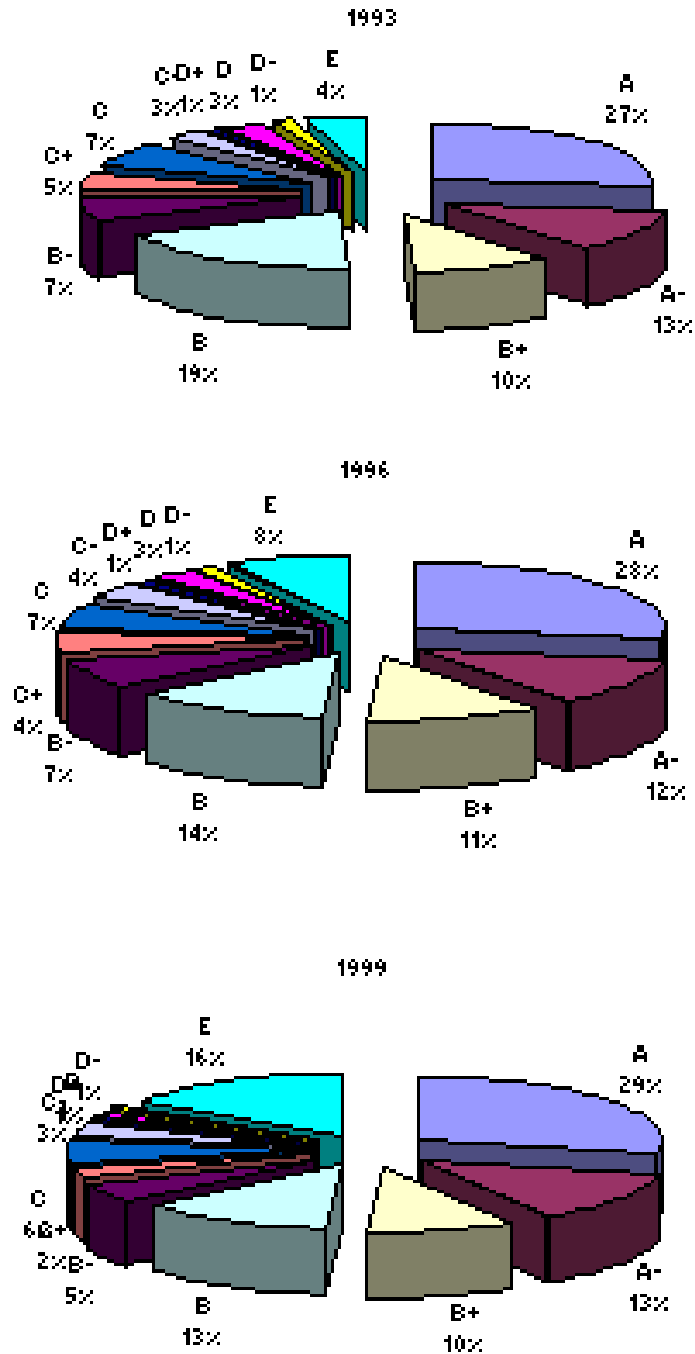


Exhibit 2: Grade distribution for Computer Science Department for 93, 96 and 99

### ENGINEERING GRADE DISTRIBUTIONS

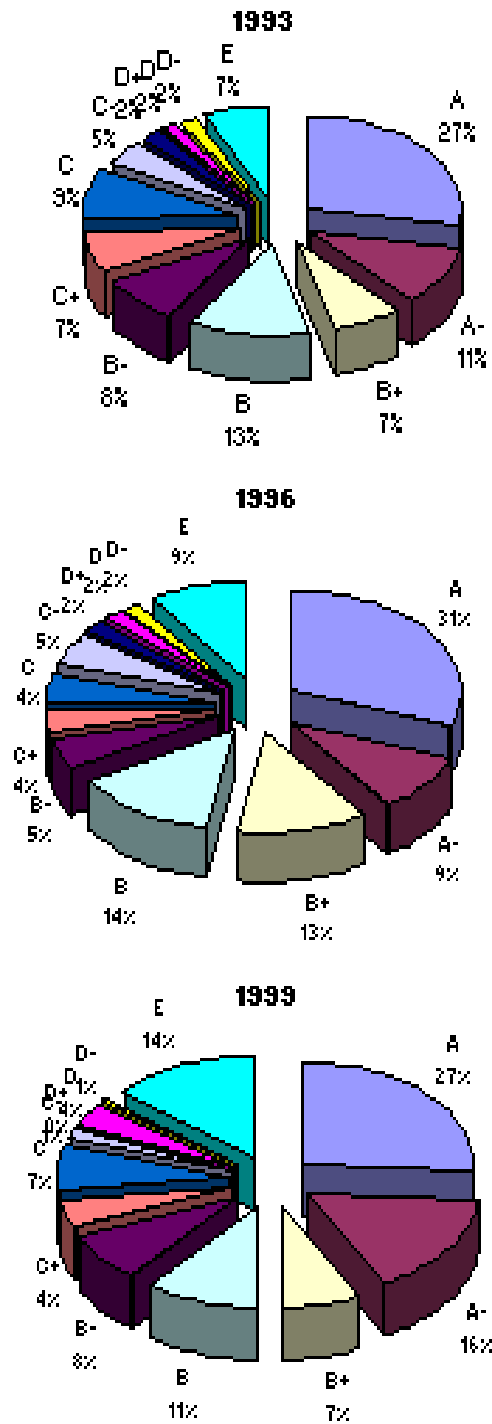


Exhibit 3: Grade distribution for Engineering Science Department for 93, 96 and 99



### F H S GRADE DISTRIBUTIONS

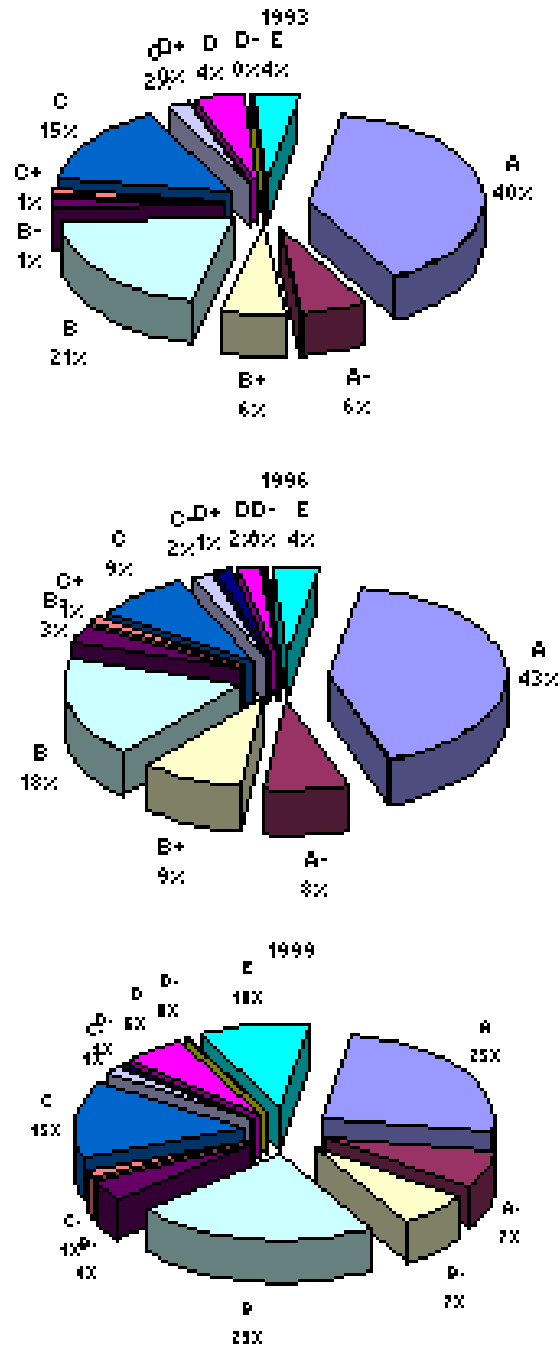


Exhibit 4: Grade distribution for Family and Human Studies for 93, 96 and 99

## MATH GRADE DISTRIBUTIONS

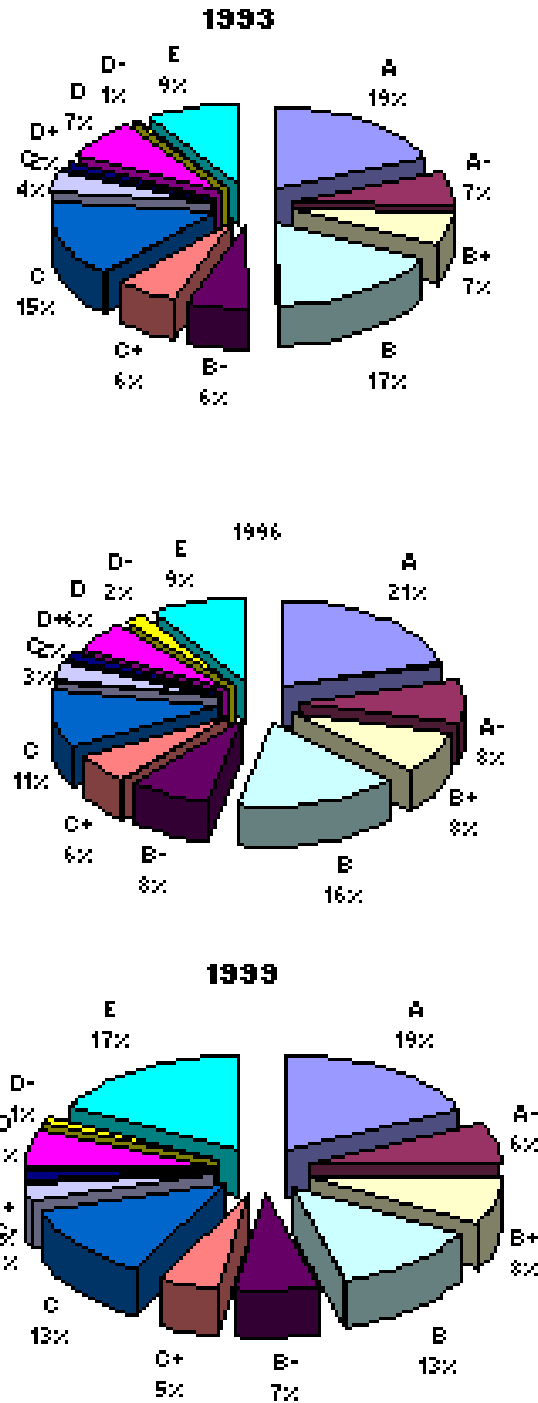
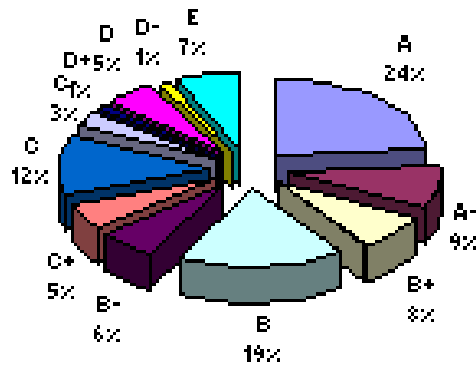
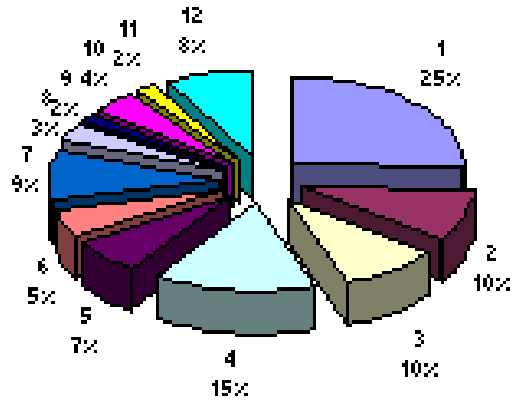


Exhibit 5: Grade distribution for Mathematics Department for 93, 96 and 99

**GRADE DISTRIBUTION for 1993**



**GRADE DISTRIBUTION for 1996**



**GRADE DISTRIBUTION for 1999**

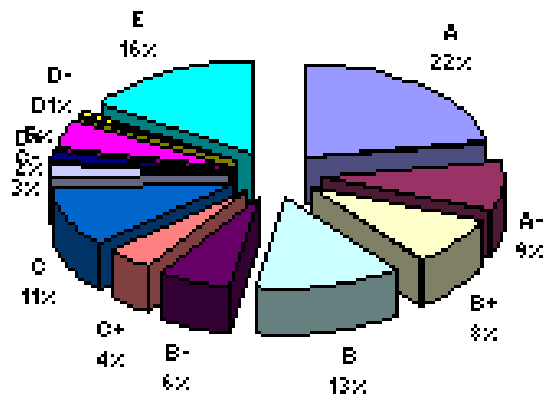


Exhibit 9: Grade distribution for all departments for 1993, 1996 and 1999

## V. Conclusion

The results of our research enable us to make the following conclusions:

A. Grade inflation is not a serious problem within the departments studied at SLCC.

The original concern over grade inflation was not verified by our research. In fact, a slight decrease in grade point average was observed for each department when 1993 data and 1999 data were compared. (Refer to Exhibit 1 and Table 1)

B. Grade distribution between departments was dissimilar .

Engineering and Mathematics exhibited a similar trend in the distribution of grades. Approximately twenty-seven percent of grades given were A, and 20% of the students failed. A-, B+, B, B-, C+, and C grades represented the remaining 53%. Mathematics awarded 20 percent A grades and failed approximately 24 percent of the students. (Refer to Exhibits 3 and 5 and Tables 3 and 5)

Twenty-eight percent of the grades given in Computer Science were A 's, while 17% of the students failed. The remaining 55% represented A-, B+, B, B-, C+, and C grades. (Refer to Exhibits 2 and Table 2)

Family and Human Studies represented the largest variation in the distribution of grades. In 1993 and 1996 over 40% of the students received the grade of A, while 10% of the students failed. The remaining 50% represented A-, B+, B, B-, C+, and C grades. (Refer to Exhibit 4 and Table 4) However the A's awarded in 1999 decreased to 25 percent and the failing grades given increased to 19 percent as represented in Exhibit 4 and Table 4

C. The trends of grade distribution within Engineering and Mathematics remained consistent.

Minimal changes in grade distribution from 1993 to 1999, were observed in engineering and mathematics departments. (Refer to Exhibits 3 and 5 and Tables 3 and 5)

D. The trends of grade distribution within Computer Science and Family and Human

Studies were less consistent.

The Family and Human Studies Department awarded more A grades in 1993 and 1996, than 1999. The percentage of A grades given decreased from approximately 40% to 25% over this time period. (Refer to Exhibit 4 and Table 4)

The Computer Science failure rate increased from 1993 to 1999. The percentage of failing grades given increased from 12% in 1993, to 22% in 1999. (Exhibit 2 and Table 2)

- E. Grade inflation appears insignificant when department data is combined. When grade results from the four departments are combined, the percentage of A's awarded remains the same. The percentage of A's given in all departments combined was 24% in 1993, and 22% in 1999. The student failure rate actually increased from 17% in 1993 to 27% in 1999. This shows no grade inflation for the four departments combined. (Refer to Exhibit 9 and Table 9)
  
- F. The Family and Human Studies had the highest passing grades, around 80%-90%. Engineering and Mathematics had the lowest passing grades, around 70%-80%, and the Computer Science Department's passing grade decreased from 87% to 78% from 1993 to 1999.

Our study pointed out that grade inflation is not a significant problem in the departments evaluated, although some variation does exist. The concern that there is a major difference between rigorous academic programs and social science programs was unsubstantiated. In fact, some programs actually exhibited a decrease in the number of A's given and an increase in the number of students who failed. Grade inflation is not the problem it once appeared to be.

Academic standards happen to be a direct result of the grades awarded to students. One of the consequences of grade inflation is compromising the academic standards at an institution. This research indicates that the academic standards in these four departments at SLCC were not compromised. In fact the academic standards in Engineering and Mathematics Departments have remained consistent. The academic standards in Family and Human Studies Department have improved from 1996 to 1999.

## V. References

1. Computer Science Department 1993 official records, Salt Lake Community College.
2. Engineering Science Department 1993 official records, Salt Lake Community College.
3. Family and Human Studies Department 1993 official records, Salt Lake Community College.
4. Mathematics Department 1993 official records, Salt Lake Community College.
5. Computer Science Department 1996 official records, Salt Lake Community College.

6. Engineering Science Department 1996 official records, Salt Lake Community College.
7. Family and Human Studies Department 1996 official records, Salt Lake Community College.
8. Mathematics Department 1996 official records, Salt Lake Community College.
9. Computer Science Department 1999 official records, Salt Lake Community College.
10. Engineering Science Department 1999 official records, Salt Lake Community College.
11. Family and Human Studies Department 1999 official records, Salt Lake Community College.
12. Mathematics Department 1999 official records, Salt Lake Community College.

Professor Nick M. Safai is the Coordinator of Engineering Science Department at SLCC . He received his PhD in Engineering from Princeton University in 1977, and Masters of Science in Aerospace and Mechanical Engineering in 1974, MSE in Civil Engineering in 1975, and MSE in Petroleum Reservoir Engineering in 1975 all from Princeton University. He holds a B.S. in Engineering from Michigan State in 1972. Prior to joining the academics , Dr. Safai worked in industry, where he served as director of the Reservoir Engineering Division at Chevron Oil Company in California. He has taught both at the graduate and undergraduate levels in engineering science. He has performed research projects for the Department of Energy (DOE), Department of Defense (DOD), National Science Foundation (NSF) and the Oil Industry. He had authored over 30 technical publications in technical journals, government & industry project reports. His research interests include; 3-D multi-phase flow through porous media, 3-D land subsidence, wave propagation in filamentary composite materials, stress concentrations, 3-D explicit-implicit finite element/finite difference mathematical modeling of fluid reservoirs, and directional drilling. He is a member of several societies including ASEE and is the International Division's Chair for Annual Programs.

Dr. Don L. Merrill is the Division Chair for Computational Science and Education at Salt Lake Community College. He received his PhD in Civil Engineering from Brigham Young University in 1994. He received a Master of Science Degree in Civil Engineering with emphasis in structural area also from Brigham Young University in 1985, and a Bachelor of Science Degree in Mathematics from the University of Utah in 1971. Dr. Merrill's area of interest is on the design and construction of thin-shelled reinforced concrete structures. Dr. Merrill is also very interested in the effective methods of providing engineering education to nontraditional and traditional students. He is a member of the American Society of Engineering Education.