Effect of Plus-Minus Grades on Graduation with Academic Distinction for Engineering Students at Wichita State University

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Background on Grade Inflation

Stuart Rojstaczer (www.gradeinflation.com) has collected grade inflation trend over the last 50 years

- Dataset includes 170 schools

Grade of C was most common grade until the Vietnam war (draft deferment effect thereafter)

Grade of A is now the most common grade

et al

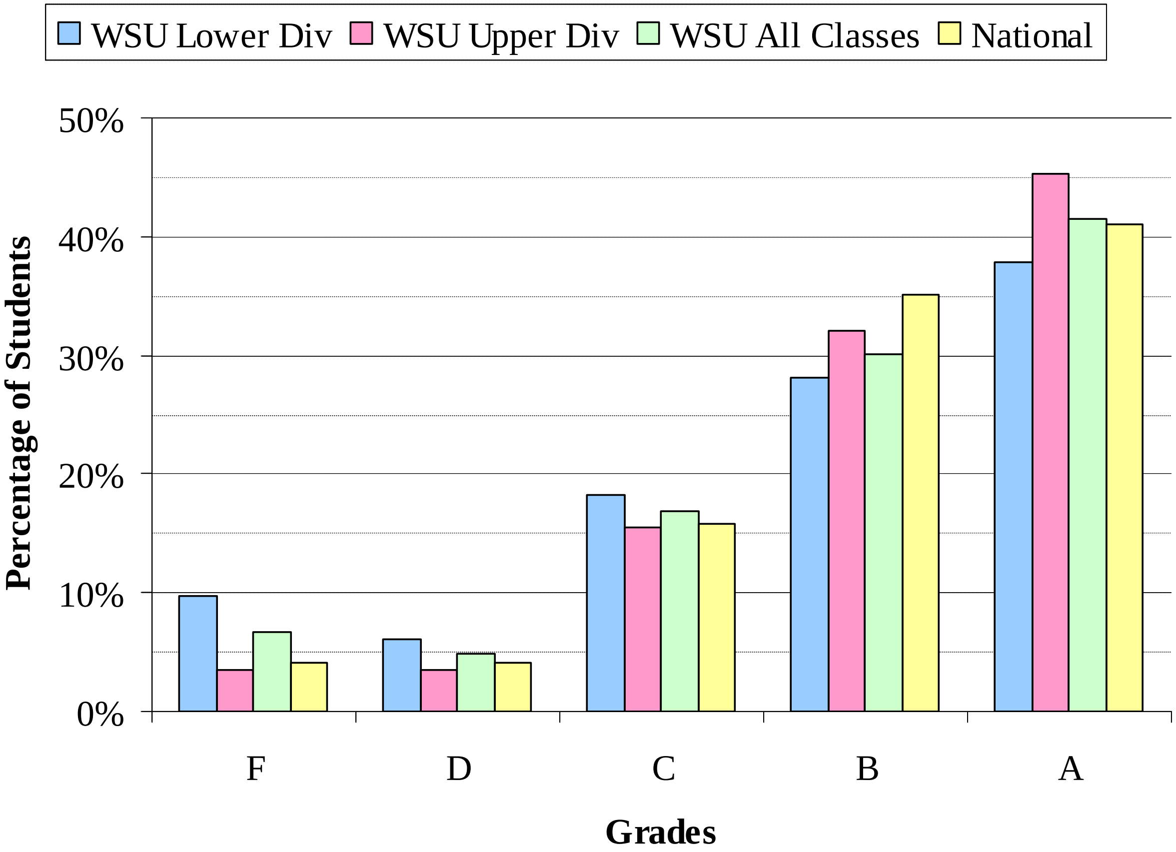
Lower Division
with 2.78 GPA

Upper Division
with 3.12 GPA

Average of two
(® 2.95 GPA)

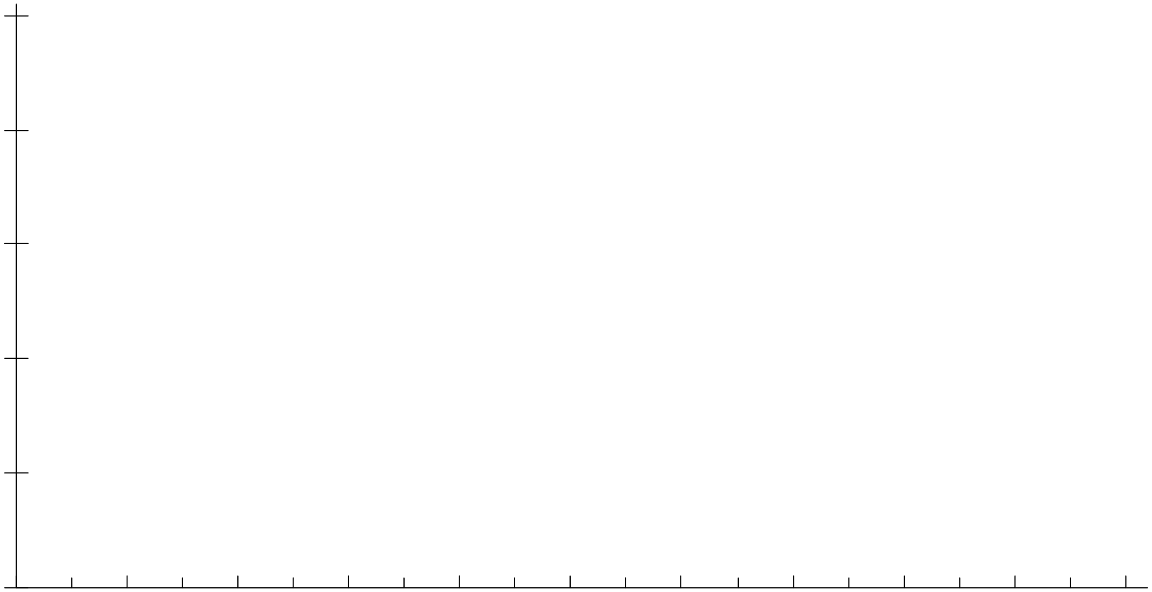
National average

not



WSU Lower Div
WSU Upper Div
WSU All Classes
National
50%
40%
30%
20%
10%
0%
Percentage of Students
F
D
C
B
A
Grades

actual



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Discussion of Score & GPA for Engineering Courses by 1st Author

Lower level class GPA < upper level class GPA

Category	# Students	# per class	Ave Score & S.D.	GPA
Sophomore Year	471	36	79 ± 17	2.51
Junior Year	529	44	80 ± 13	2.85
Overall Average	1000	40	80 ± 14	2.70

for both whole-letter grade and +/- grade, respectively

Category	# Students	# per class	Ave Score & S.D.	GPA
Sophomore Year	471	47	76 ± 15	2.23
Junior Year	549	61	81 ± 11	2.68
Overall Average	1020	54	79 ± 13	2.48

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Discussion of Score & GPA for Engineering Courses by 1st Author

Standard deviation narrows for +/- grades – possible cause?

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Discussion of Score & GPA for Engineering Courses by 1st Author

Could change to +/- grades cause this difference?

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Convert to whole-letter grades & re-calculate GPAs ® no change

Category	# Students	# per class	Ave Score & S.D.	GPA
Sophomore Year	471	47	76 ± 15 2.22	¬ 2.23
Junior Year	549	61	81 ± 11 2.69	¬ 2.68
Overall Average	1020	54	79 ± 13 2.48	¬ 2.48

Discussion of Score & GPA for Engineering Courses by 1st Author

Recent (+/- grade) class size larger ® likely cause of GPA ¯

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- Topic for future paper

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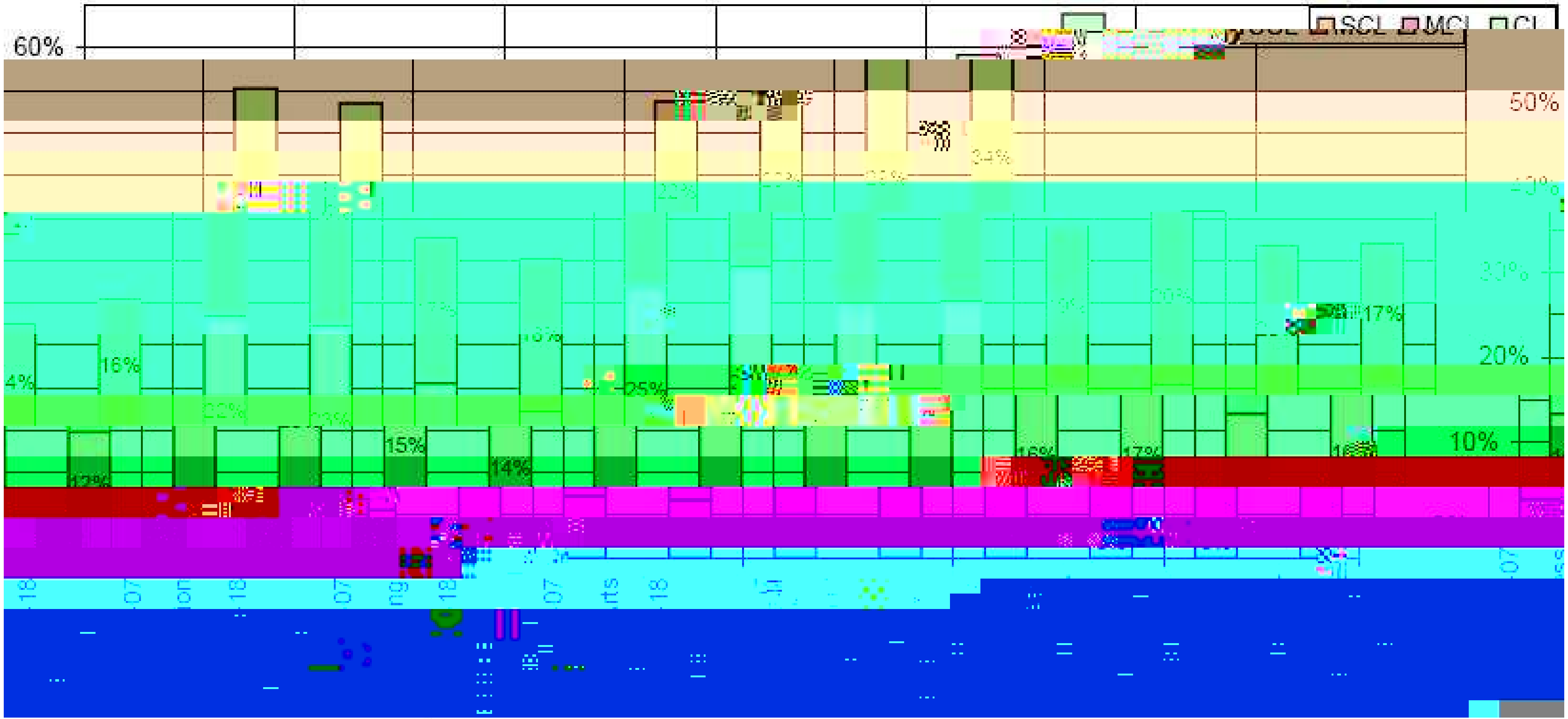
Results of Graduation with Academic Distinction by Discipline

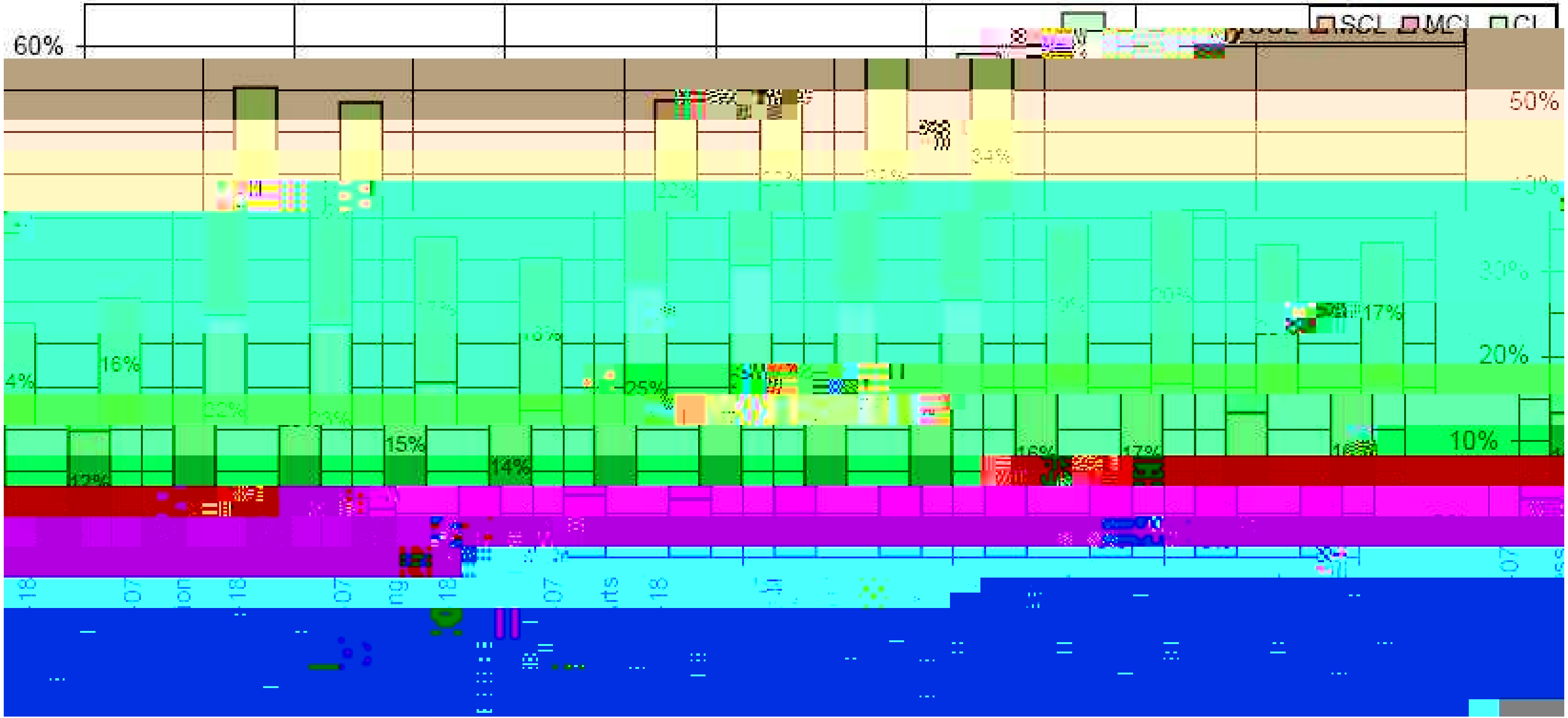
Results by discipline: whole-letter grade on left & +/- grade on right

SCL = orange (bottom), MCL = pink (middle), CL = green (top)



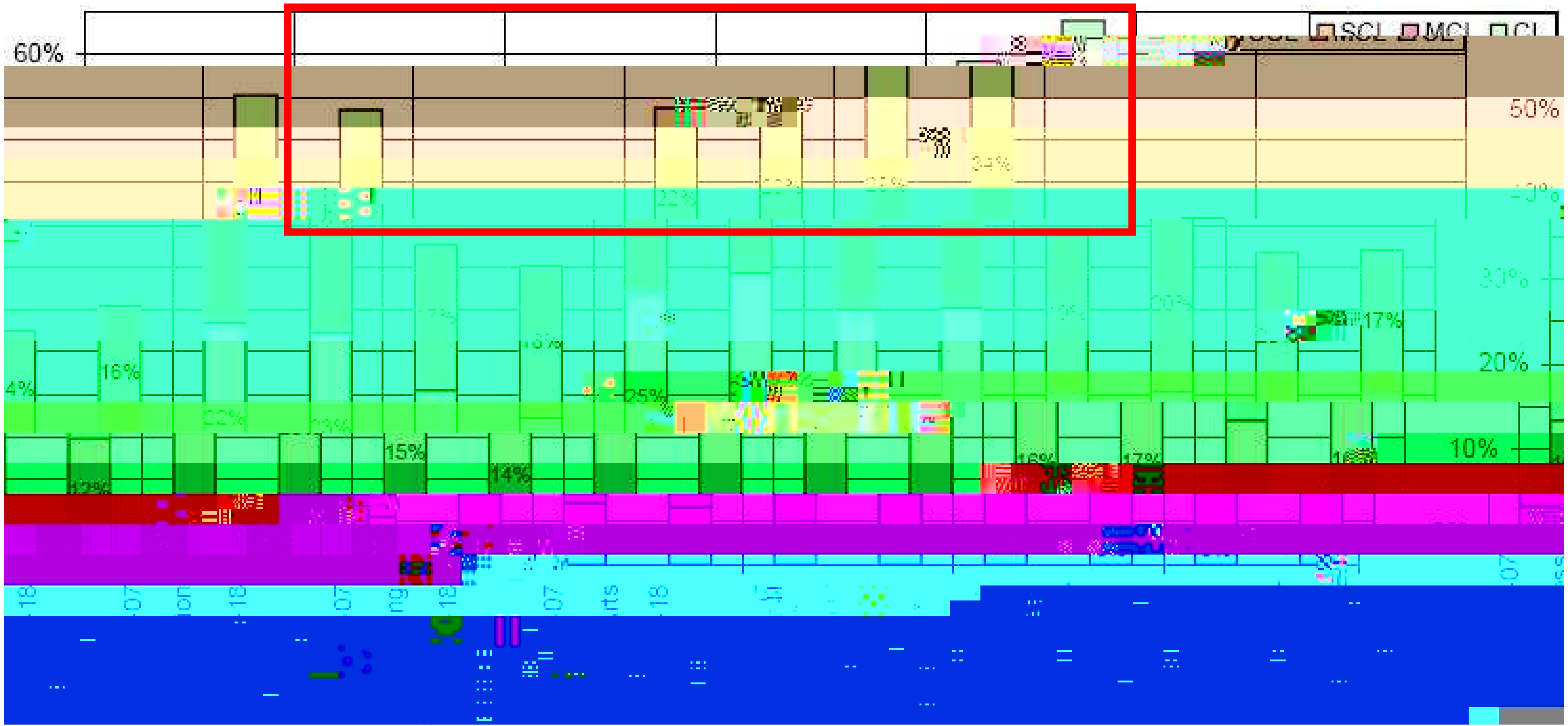
Results of Graduation with Academic Distinction by Discipline

Comparing across disciplines is not meaningful because of differing requirements



Results of Graduation with Academic Distinction by Discipline

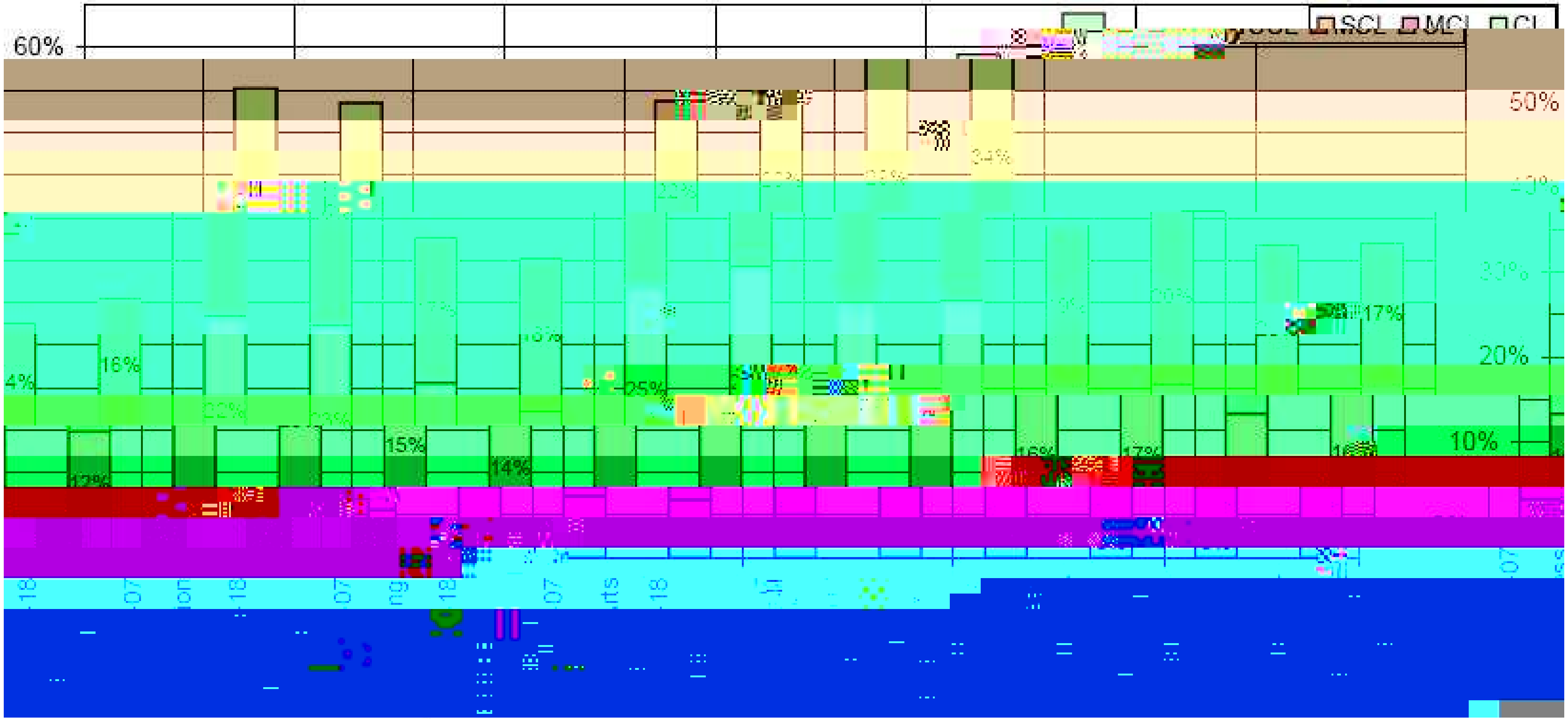
- Example 1: Education & Health Professions requires GPA$\geq$2.5
- Example 2: Fine Arts requires passing sophomore review



Results of Graduation with Academic Distinction by Discipline

Most disciplines increased number of graduates with distinction

Finer details & observations easier to see from tabular results



Change in Number of Graduates with Academic Distinction by Discipline

Table gives amount of change: those under whole-letter grade minus those 14 19 7n< 1a8 98/a89-

Change in Number of Graduates with Academic Distinction by Discipline

Number of SCL decreased for almost every discipline

- Only exception is Liberal Arts B.S.

Discipline	SCL	MCL	CL	SCL+MCL+CL
Business	–0.7%	+2.2%	+1.4%	+2.9%
Education (now Applied Studies)	–1.5%	+0.3%	–0.6%	–1.8%
Engineering	–2.1%	–1.2%	+0.8%	**–2.9%**
Fine Arts	–0.4%	+2.5%	–1.2%	+0.9%
Health Professions	–0.6%	+0.9%	+4.6%	+4.9%
Liberal Arts B.A.	–0.6%	+0.9%	+1.4%	+1.7%
Liberal Arts B.S.	+0.8%	+2.4%	–3.0%	+0.2%
Entire University	–0.5%	+2.1%	+2.1%	+3.5%

Change in Number of Graduates with Academic Distinction by Discipline

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Education (now Applied Studies)	–1.5%	+0.3%	–0.6%	–1.8%
Engineering	–2.1%	–1.2%	+0.8%	**–2.9%**
Fine Arts	–0.4%	+2.5%	–1.2%	+0.9%
Health Professions	–0.6%	+0.9%	+4.6%	+4.9%
Liberal Arts B.A.	–0.6%	+0.9%	+1.4%	+1.7%
Liberal Arts B.S.	+0.8%	+2.4%	–3.0%	+0.2%
Entire University	–0.5%	+2.1%	+2.1%	+3.5%

Change in Number of Graduates with Academic Distinction by Discipline

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Education (now Applied Studies)	–1.5%	+0.3%	–0.6%	–1.8%
Engineering	–2.1%	–1.2%	+0.8%	**–2.9%**
Fine Arts	–0.4%	+2.5%	–1.2%	+0.9%

Summary

Effect of +/- grading system on graduation with academic distinction was considered

- Data sets consisted of five-year periods when whole-letter grades were used and for a similar period under +/- grading

Overall, the number of *summa cum laudes* decreased with +/- grading while the number of graduates in other distinction categories increased

In engineering, there was a decrease in *summa* and *magna cum laudes* without a corresponding increase in *cum laudes*

Actual grade distributions in Engineering classes were also considered

- Increased class size appeared to affect student performance
- This is a topic for future study