Georgia Institute of Technology  
Office of Institutional Research & Planning  
Grade Substitution Study  

Summary of Findings

The Office of Institutional Research & Planning conducted an analysis on the effect of the proposed grade substitution policy at the request of the Registrar’s Office. The study will be conducted in two phases. Phase I identifies the effect of grade substitution on students who are “at risk” academically. Phase II will review the effect of grade substitution on students who are in good academic standing.

Data from the grade substitution study shows that students from the 2002 freshman cohort would have higher cumulative GPAs by replacing one or two grades with a better grade. Students from the cohort may have left Georgia Institute of Technology for various reasons, but many may not have stayed based on grades received while attending. If that is the case, grade substitution would increase cumulative GPAs enough to retain more students. This study shows the changes in cumulative GPAs by replacing Fs with As, Bs, Cs, and Ds. Replacing F letter grades (versus D letter grades) with better grades will have the most impact upon cumulative GPAs, and thus were used in this study.

Using the 2002 freshman cohort as a sample of the Tech population, data showed that when these students repeated a course they were more likely to change an F to a C than they were to an A. Since students have so few credit hours their freshman year, changing an F to a C has a significant change in cumulative GPAs. Of the students in the freshman cohort who had a cumulative GPA between a 1.0 and 1.7, 103 made at least one F worth four credit hours. Of those, 62 (60%) would improve their GPA to a 1.7 cumulative GPA or higher by replacing just one F with a C. Replacing one F with a D would improve 40 (39%) students to a 1.7 cumulative GPA or higher. Replacing multiple Fs would have an even more significant improvement in cumulative GPAs.

There were 92 students who were not in good standing and received at least one F worth four credit hours, when they left Georgia Institute of Technology. By replacing one F with:

A, 48% (44) would improve to a 1.7 or better
B, 34% (31) would improve to a 1.7 or better
C, 27% (25) would improve to a 1.7 or better
D, 21% (19) would improve to a 1.7 or better

Potentially 44 students replacing an F with an A would improve their status. If academic standing was the reason they left Georgia Tech, many may be retained. Retention for this cohort could have risen 2% to 92%, if all 44 students had returned their second year.

Two students were used as a sample of what grade substitution could do for the individual. The first student had a lower GPA, was on good standing fall 2003, on probation spring and summer 2003 and by fall 2003 was back on good standing. In spring of 2003, this student was placed on probation due to a low cumulative GPA. The student made two Fs in the spring of 2003. If the next term the student went and took one class over and made an A, his GPA would jump to a 1.83 and would be in good standing. If the class was retaken and the student received a D in replacement, he still would have recovered from probation in one term. At the end of fall 2003, this student had a 1.88 cumulative GPA. By replacing one F in the summer of 2003 with an A, he would have a 2.25, a 2.16 by replacing
it with a B, a 2.07 by replacing it with a C, and a 1.98 when replacing it with a D at the end of fall 2003; a significant improvement.

The second student was not retained after spring 2003. The student was in good standing at the end of fall term 2002 with a 1.87 cumulative GPA. In the spring of 2003, the student was placed on warning, after mediocre grades and one F with a cumulative GPA of 1.46. Had the student stayed on through summer and retaken the class they received an F in, they would have been able to redeem the 1.46 cumulative GPA to a 1.89 with an A and a 1.79 with a B. It is hard to determine if this would have caused the student to remain at Tech, but it would have greatly improved his/her chances of succeeding.

**Summary of Data**

This study used the 2002 freshman cohort as a sample group to determine the effectiveness of the policy. The cohort is defined as freshmen who entered in the summer or fall of 2002 but were full-time in the fall of 2002. Grade substitution in this study was defined as replacing a grade with another grade and using the new grade to recalculate the individuals cumulative GPA based on credit hour worth. Subsets of students were pulled out based on whether they received a letter grade of F at the 1000- or 2000-course level. Only those Fs worth either four credit hours or three credit hours were replaced in the study.

**Multiple Grades**

Fall 2002 freshmen were tracked over each term they attended Georgia Tech from summer 2002 through fall 2003. Students who repeated a class were analyzed to determine the number of times taking the course and the changes in their letter grades. A total of 571 classes were repeated. The data showed that grade change most likely was from a D to a C (18.4%). The second most likely change was from an F to a C (17.3%) followed by D to B (14.2%). Some students replaced an F with an F (11.4%) while several replaced an F with a D (11%). Only 2.5% replaced an F with an A. Courses that were most likely to be repeated were MATH 1502, MATH 1501, PHYS 2211, and CS 1321. Below is a summary of this data.

<table>
<thead>
<tr>
<th>Grade Change</th>
<th>Number from Cohort</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>D to C</td>
<td>105</td>
<td>18.4%</td>
</tr>
<tr>
<td>F to C</td>
<td>99</td>
<td>17.3%</td>
</tr>
<tr>
<td>D to B</td>
<td>81</td>
<td>14.2%</td>
</tr>
<tr>
<td>F to F</td>
<td>65</td>
<td>11.4%</td>
</tr>
<tr>
<td>F to D</td>
<td>63</td>
<td>11.0%</td>
</tr>
<tr>
<td>F to B</td>
<td>52</td>
<td>9.1%</td>
</tr>
<tr>
<td>D to D</td>
<td>42</td>
<td>7.4%</td>
</tr>
<tr>
<td>D to A</td>
<td>24</td>
<td>4.2%</td>
</tr>
<tr>
<td>D to F</td>
<td>18</td>
<td>3.2%</td>
</tr>
<tr>
<td>F to A</td>
<td>14</td>
<td>2.5%</td>
</tr>
<tr>
<td>C to A</td>
<td>5</td>
<td>0.9%</td>
</tr>
<tr>
<td>B to B</td>
<td>1</td>
<td>0.2%</td>
</tr>
<tr>
<td>C to D</td>
<td>1</td>
<td>0.2%</td>
</tr>
<tr>
<td>B to A</td>
<td>1</td>
<td>0.2%</td>
</tr>
<tr>
<td>Total</td>
<td>571</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
A letter grade of C is often the minimum a student must make for their major requirements. With an incentive to replace a grade, students may be more apt to improve greatly upon a grade instead of changing from an F to a C; i.e. they may work harder to replace it with an A.

**Potential Increases in Cumulative GPAs**

Students in the 2002 freshman cohort who had a cumulative GPA of 1.0 to 1.7 at the end of spring 2003 semester were included in this grade analysis. Grades students received for summer 2002 thru spring 2003 were analyzed.

In the spring of 2003, 2,211 of the fall 2002 freshmen cohort students were enrolled. Of those, 146 had a cumulative GPA between 1.0 and 1.7. Students who had one or more Fs worth three or four credit hours were used to recalculate the GPAs by grade substitution. Of the 146 who had a cumulative GPA between 1.0 and 1.7; 103 made at least one F worth four credit hours and 88 made at least one F worth three credit hours. If the student received one F, their cumulative GPA was recalculated by replacing only one grade based on credit hours. If the student received more than one F, their GPA was also recalculated by replacing two Fs with two grades (AA, BB, CC, DD) based on credit hours.

Of the 103 who received at least one F worth four credit hours, if the F were changed to an A 95.2% would improve their GPA to a 1.7 or better, 61% would improve to 2.0 or better, and 25% would improve to a 2.2 or better. Students were more likely to change an F to a C. For the 103 who had at least one F; 60% would improve their GPA to a 1.7 or better, 9% would improve to a 2.0 or better, and 2% would improve to a 2.2 or better if they changed one F to a C. Replacing an F with a D shows that 39% would improve to a 1.7 GPA or better. Below is a summary of these students:

![Graph](image)

There were 41 students who received more than one F worth four credit hours. When students replaced two Fs with two As, all increased to a GPA of 1.7 or better, 95% increased to a 2.0 or better, and 95% increased to a 2.2 or better. When replacing two Fs with two Cs, 95% would have a 1.7 or better, 54% would have a 2.0 or better and 22% would have a 2.2 or better.
Of the 88 who received at least one F worth three credit hours, when GPAs were recalculated based on replacing the F with an A, 78% would improve to a GPA of 1.7 or better, 38% would improve to a 2.0 or better, and 2% would improve to a 2.2 or better. When an F was changed to a C, 48% improved to a 1.7 or higher. When an F was replaced with a D, 28% would improve to a 1.7 or higher. Below is a summary of data:

There were 20 students who received more than one F worth 3 credit hours. When two Fs were replaced with two As, all of those students improved to above a 1.7. When two Fs were replaced with two Bs, 60% improved to a 1.7 or better, and replacing the Fs with Ds improved 25% to a 1.7 or better.
Replacing letter grades had a significant impact on students’ cumulative GPAs. Even replacing one F with a D worth four credit hours would improve 40 students’ GPAs to above a 1.7 GPA, which is the minimum satisfactory average for freshmen. Changing one F to a C worth four credit hours would improve 62 students’ GPAs to a 1.7 or better. A more significant impact is replacing two Fs with two new letter grades. Students could benefit from making even small changes to grades and replacing Fs.

Effect on Retention of Students
Of the 2,277 students in the 2002 freshman cohort, 238 did not return for a second fall term. GPAs and Academic Standing are based on their last term attending (fall 2002, spring 2003 and summer 2003). Of those 238 not retained, 99 made at least one F worth four credit hours, and 84 made at least one F worth three credit hours.

Of those students who were not retained, 99 made at least one F worth four credit hours. Nineteen of those had a cumulative GPA at or above 1.7, while 13 had a cumulative GPA at or above 2.0. These students are included in the summary analysis of four credit hour courses. If one F is replaced with one A, 52% would be at or above a 1.7, 35% would be at or above a 2.0, and 28% would be at or
above a 2.2. Replacing one F with a C, 32% would be at or above a 1.7, 23% would be at or above a 2.0, and 16% would be at or above a 2.2. Below is a summary of the data:

Forty-seven students made more than one F. Of those, two were at or above a 1.7. By replacing two Fs with two As, 85% improve to a 1.7 or above. By replacing two Fs with two Bs 62% improved to a 1.7 or above. By replacing two Fs with two Cs, 11% improved to a 1.7 or above. Below is a summary of the data:

There were 49 students who were Academically Dismissed who received at least one F worth four credit hours. Of those, 27% would improve to a 1.7 or better by replacing one F. Thirty students made more than one F worth four credit hours. Of those, 93% would improve to a 1.7 or better when replacing two Fs with two As. By replacing two Fs with two Bs, 57% would improve to a 1.7 or better. By replacing two Fs with two Cs, 27% would be at 1.7 or better. Seven percent would improve to a 1.7 or better by replacing the Fs with two Ds.
Academically Dismissed Students
Replacing Two Fs Worth Four Credit Hours

Of those who were not retained, 84 made at least one F worth three credit hours. Nine of those had a cumulative GPA at or above 1.7, while four had a cumulative GPA at or above 2.0. These students are included in the summary analysis of three credit hour courses. For these students, if one F is replaced with one A, 32% would be at or above a 1.7, 19% would be at or above a 2.0, and 12% would be at or above a 2.2. Replacing one F with a C, 21% would be at or above a 1.7, 11% would be at or above a 2.0, and 5% would be at or above a 2.2.

Freshmen not Retained
Replacing One F Worth Three Credit Hours

Forty-seven students made more than one F. Of those, one was at or above a 1.7. By replacing two Fs with two As, 60% improve to a 1.7 or above. By replacing two Fs with two Bs 37% improved to a 1.7 or above. By replacing two Fs with two Cs, 12% improved to a 1.7 or above, and 9% improved to a 1.7 or higher when replacing Fs with Ds.
There were 47 students who were on Academic Dismissal who made at least one F worth three credit hours. Of those, 13% would improve to a 1.7 when replacing an F with an A. Of the 30 students who made two or more Fs, by replacing two Fs with two As, 47% would improve their GPA to 1.7 or better and 23% to a 2.0 or better.

The following chart is a summary of those fall 2002 freshmen that were not retained and were not in Good Standing their last term at Georgia Tech. These students received at least one F worth four credit hours.

![Freshmen not Retained Leaving without Good Standing](chart.png)

**Conclusions**

Data from the grade substitution study shows that students from the 2002 freshman cohort would have higher cumulative GPAs by replacing one or two grades with a better grade. Students from the cohort may have left Georgia Institute of Technology for various reasons, but many may not have stayed based on grades received while attending. If that is the case, grade substitution would increase cumulative GPAs enough to retain more students. This study shows the changes in cumulative GPAs by replacing Fs with As, Bs, Cs, and Ds. Replacing F letter grades (versus D letter grades) with better grades will have the most impact upon cumulative GPAs, and thus were used in this study.

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