

Report of the Senate Academic Standards, Regulations, and Admissions Committee (ASRAC) on Plus/Minus Grades

Charge (S-0106): *Explore the question of whether minus grades should be added to the default University grading system.*

Introduction

In approximately 1980, Rutgers University adopted the following default grading system:

A	= 4.0	Distinguished
B+	= 3.5	
B	= 3.0	Good
C+	= 2.5	
C	= 2.0	Satisfactory
D+	= 1.5	
D	= 1.0	Poor
F	= 0.0	Failing

(For details, see <http://registrar.rutgers.edu/NB/FACULTY.HTM#grades> .)

Units may depart from this system upon recommendation of the University Senate and approval of the Board of Governors. Mason Gross and the law schools at Newark and Camden have adopted non-default systems. For instance, in 2001, the Board of Governors permitted Camden Law to adopt a system that incorporates minus as well as plus grades. The Camden Law system works as follows:

A+		4.33
A	Distinguished	4.00
A-	Intermediate grade	3.67
B+	Intermediate grade	3.33
B	Good	3.00
B-	Intermediate grade	2.67
C+	Intermediate grade	2.33
C	Satisfactory	2.00
C-	Intermediate grade	1.67
D+	Intermediate grade	1.33
D	Poor	1.00
F	Failing	0.00

When the Senate recommended approval of this system, several senators and faculty members became interested in the possibility of also adding minus grades to the default system. The New Brunswick faculty council adopted a resolution calling for the establishment of grades of A- and B-. (That resolution may be found at: http://nbfc.rutgers.edu/res1_18_02grades.htm.)

The Senate's Executive Committee in 2001 issued charge S-106 to ASRAC. This charge called upon ASRAC to explore the question of adding minus grades to the default University grading system. (The Executive Committee did not ask ASRAC to explore the possibility of establishing an A+, nor has ASRAC considered the matter.)

The Senate held an informal discussion on the matter at its March, 2002 meeting. The faculty members who spoke were virtually unanimous in favor of a plus/minus system; the students almost all expressed strong reservations. (We understand that the faculty discussions before the New Brunswick Faculty Council were more mixed.) In May, 2002, ASRAC informed the Senate that it wished to delay further consideration until resolution of the proposed "restructuring" of Rutgers University. Our investigations had shown that several hundred students are cross-registered between Rutgers-Newark and the New Jersey Institute of Technology (NJIT). Our understanding was that NJIT, which uses the current Rutgers default system, did not want to consider changing systems. This would cause hardship for cross-registered students because they would be graded on two different systems. Resolving the matter with NJIT would be difficult pending consideration of possibly merging NJIT with Rutgers in some way.

The restructuring proposal was eventually deferred indefinitely. It is our information that NJIT might well be more willing than in the past to change grading systems if Rutgers does. ASRAC therefore took up the matter again.

Our Recommendations

The arguments for adding minus grades are as follows.

1. Minus grades would allow for greater flexibility in grading. Under our present system, performances that are above C can be classified only into the four categories of A, B+, B and C+. This means that a large range of performances can often be classified as being identical for grading purposes. Adding A- and B- would give an additional two gradations, thus allowing faculty greater ability to distinguish among varying student performances and reward students for stronger work.
2. Our current system considers B+ as a 3.5 on a 4.0 scale. At most other AAU institutions that utilize a 4.0 scale, a B+ is considered a 3.3, and an A- is considered a 3.7. This arguably presents a "truth-in-advertising" problem because a B+ at Rutgers is not equivalent to a B+ at peer institutions. There may also be a similar problem with our A in that our A includes performances that would be considered A- at other institutions.

Some of us have informally heard that many faculty would prefer to switch to a plus/minus system. However, this has not been the case in our ASRAC discussions. Most of our faculty members are either skeptical or appear not to have strong views on the matter. Our student members are firmly opposed, which has been the case over several years without regard to change in student membership. The ASRAC students express the belief that there is nothing wrong with our present grading system, and hence no need to change it.

There is particular fear that grade-point averages would go down under the new system. The statistics from Camden-Law were questioned on the grounds that what is true in a law school might not be true in, for example, science and engineering courses. Moreover, the burden of a change would fall primarily on students who are in the A range. Students whose performance is in the 3.75 to 3.83 range in a course presently receive A's at Rutgers, because their performance is closer to the 4.0 A than to the 3.5 B+. Let us suppose, though, an A- is established at a 3.67. These students will now receive A-'s, because their performance will be closer to that grade than to an A. There may well be a compensating number of students whose present B+ performances become A-'s, but still the burden has fallen on students who are performing in the lower part of the A range.

Some of our members suggest a different course: that the University adopt the split-letter grading system at the University of Wisconsin summarized below. This system proceeds in steps of half a grade, so that there is a 4.0, a 3.5 and a 3.0, just as Rutgers does. The difference is that the 3.5 grade is denominated an AB. This makes clear that our B+ is not, as at most institutions, a 3.3 or a 3.33, but rather falls exactly between an A and a B. This change would help our students. We understand that the Law School Data Assembly Service currently counts a Rutgers B+ as a 3.33 rather than as a 3.5. In contrast, an AB would be counted as a 3.5, thus giving full weight to Rutgers' grades. We suggest that the Senate Executive Committee might wish to issue to a Senate standing committee a charge for further exploration of this issue.

The committee also gave consideration to the proper process for changing to a plus/minus system. A change in grading systems obviously has great day-to-day importance to students and faculty. It would be desirable to have a process that would allow all to understand the issues and to have a chance to be heard. Such a process should probably go beyond the usual Senate procedures, just as with the recent debate about transforming undergraduate education.

In May, 2002, Senate Secretary Ken Swalagin, at the instruction of the Senate Executive Committee, wrote to then University Vice President Joseph Seneca to solicit suggestions about how a broadly representative process could be established. The Vice President's response contained few concrete suggestions. It seems to us that considerable involvement by the Rutgers Administration would be necessary in structuring a process, just as with the recent debate over transforming undergraduate education, and that this matter ought to proceed only if the Administration believes it to be a priority. ASRAC does not believe it has the resources or the expertise to conduct the kind of university-wide process that would be necessary. We believe that it makes sense to go forward only if we are strongly inclined to adopt a new grading system.

Given the lack of enthusiasm in the ASRAC for a change of default grading system, the committee recommends, for the reasons given in this report, that no further consideration be given to shifting the default University grading system to a +/- system.

The remainder of this report summarizes what we know about the pros and cons of a grading system that contains both pluses and minuses.

Grading Systems at Other Institutions

We gathered data on the grading systems of the 62 other AAU institutions. We found the following:

1. The school that comes closest to our grading system is the University of Florida: A, B+, B, C+, C, D, and F. The only difference between Rutgers and Florida is that Florida uses the D+, and we do not.
2. Michigan State University uses our GPA system, but does not provide letter grades: 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1.0, 0.0. Like Florida, Michigan uses the 1.5 (D+) and we do not. Michigan State has no plans to change its system.
3. The University of Wisconsin-Madison grading policy reflects the same GPA policy as ours (4.0, 3.5, 3.0, 2.5, etc.), but uses split-letter grades to represent the .5 decimals rather than a plus/minus system: A, AB, B, BC, C, D, F.
4. It is most common for schools to use both plus and minus grades, or neither. The following schools use neither plus nor minus grades but instead only use: A, B, C, D, E/F
 - Brown [no D]
 - Carnegie Mellon
 - Case Western Reserve
 - Columbia
 - MIT
 - Purdue
 - The University of Kansas
 - The University of Texas at Austin
5. The rest of the AAU institutions (the remaining 50) use a combination of plus and minus grades. The greatest difference within this group concerns whether an A+ is given. The plus grades are generally considered a .3 or a .33, and the minus grades a .7 or a .67. Using the two-digit system has the advantage of resulting in equal steps between grades, rather than a .3 differential between, for instance, and a B and a B+ and a .4 differential between a B+ and an A.

Experience at Other Institutions With Both Plus and Minus Grades ¹

The literature on the pros and cons of grading systems is surprisingly small. A literature search revealed the following:

1. There is a clear trend away from simple letter grades, and toward plus/minus systems. In 1982, simple letter grade systems accounted for 60 percent of university grading systems. By 1992, this proportion had decreased to 47 percent, with the proportion of plus/ minus systems

¹ A lengthy statistical breakdown has been furnished to the Senate's office, and is available on request.

moving up from 25 percent to 40 percent. As our discussion above illustrates, plus/minus systems seem to be particularly popular at our AAU peer institutions.

2. Because the Rutgers system is relatively uncommon, little literature exists that compares it to other systems. Instead, inferences have to be drawn from comparisons between simple letter systems and plus/minus systems. Literature even on this point seems sparse. Review of existing literature did, however, disclose the following:
 - a. There is little evidence that a plus/minus system reduces grade-point averages.
 - b. There is some evidence that a plus/minus system reduces grade inflation. This is not a major concern at Rutgers, where grades appear to have been stable over a prolonged period.
 - c. There is some evidence that a plus/minus system gives students more incentive to prepare and achieve even after the majority of the work for the course has been evaluated. A .33 shift in grade, after all, is more plausible than a .50 shift, and so a student in a course with multiple assignments may decide that it makes sense to work hard even on the final assignments.
 - d. There are more grade changes as more grades are added. Research at Georgia State University disclosed that this is not primarily a result of more student appeals; rather, faculty made more mistakes in filling out grading forms because they had more choices. Most likely, this could be dealt with through proper design of forms.
 - e. At least one institution with a plus/minus system has found that its professors do not all use the system, but adhere to only using A, B, etc. We understand that there are many graduate departments at New Brunswick where this often occurs.

The ASRAC appreciates the help of Ken Iuso, Rutgers University Registrar, in soliciting comments about plus/minus systems from registrars at other institutions. Those reporting said that they knew of no evidence indicating that the use of such systems decreases grades. However, virtually none had performed an analysis designed to look for such evidence. Moreover, most of these schools had switched to plus-minus from a system with neither pluses nor minuses, and so their experience may not be comparable to ours. A summary of the responses appears in Appendix A.

Earl Hawkey, Registrar of the University of Nebraska's main campus in Lincoln, sent us his statistical analysis. That institution changed from our present system to a system with both pluses and minuses, and so its experience may be relevant. (We must note that their system has an A+, while ours does not.) Hawkey undertakes an analysis of grades following each fall semester.

Here are the mean grades he found for the 1995-1996 through 2000-2001 period when Nebraska-Lincoln had pluses and no minuses:

1995-1996	2.96
1996-1997	3.00
1997-1998	3.02
1998-1999	3.05
1999-2000	3.07
2000-2001	3.11

(Note that there appears to be a steady increase in grades over this period.)

Here are averages beginning with the Fall 2001-2002, when the plus/minus system took effect:

2001-2002	3.05
2002-2003	3.07
2003-2004	3.09
2004-2005	3.10
2005-2006	3.08

Hawkey concludes from these statistics that it "does not appear that there were any significant long-term changes in practice that resulted from the new grading system. It also appears that we may have stabilized at this point in regards to grade inflation. But there is no evidence that the two were linked in any way." It might also be possible, though, that the plus/minus system decreased grades from what would otherwise have been the case. The full analysis may be found in Appendix A.

We also received a detailed analysis from David Robb, Registrar of the University of Maryland. This institution had neither pluses nor minuses. Beginning in 1991, the University Senate of Maryland voted to establish plus and minus grades on a trial basis: to include them on transcripts, but not to count them in grade-point average. Hence a B, a B- and a B+ all had equal weight. (Robb tells us that, nonetheless, services like the Law School Data Assembly System and the American Medical College Application System took the pluses and minuses into account in calculating student grade-point averages.) Maryland has since decided that, beginning in the fall of 2006, plus and minus grades will be counted in grade-point averages.

Robb found that the number of A grades (A+, A, and A-) under the new system equaled the number of A's given under the old system, and that the proportion of grades that were either in the A or B range did not change. He did note that more A grades went down to A-'s than increased to A+'s. This, he wrote, "appears to confirm the fears of those 'A' students who believed they were most at risk with the advent of +/- grading."

Comments from other registrars may be found in Appendix B.

Experience at the Law School-Camden

As mentioned earlier, Rutgers Law School-Camden switched from the default University to a plus/minus system in 2001. The proposed change went through an extensive process before being adopted. The faculty voted in September 1999, to give the law-school community notice and explanation of the proposed new grading system. All members of the community were invited to submit written comments. A number of meetings were held to allow participants to raise their questions and concerns about the proposal. Changes were made in the proposal in response to comments received. The final memorandum recommending approval was circulated to the law-school community before the new grading system was adopted by the faculty.

Camden-Law has had several years of experience with minus grades since establishment of the new system in the fall of 2001. The transition appears to have been smooth. Grades that were given under the old system continue to have the weight they already had in calculating grade-point averages. The Registrar's office included on every transcript that had both "old" and "new" grades a reference to a web site at which the transition was explained. There were no complaints, so far as we are aware, from law students, alumni or employers about the transition.

The following set of numbers traces the changes in the 75th, 50th, and 25th percentile of grade-point averages at graduation, demonstrating the new system's effect on grades:

Class of	75th	50th	25th
1995	3.375	3.125	2.855
1996	3.426	3.226	2.892
1997	3.415	3.197	2.938
1998	3.454	3.167	2.900
1999	3.427	3.200	2.927
2000	3.435	3.262	3.012

Note that these are all numbers from the previous system of pluses and no minuses.

Here are the statistics for the five years following the adoption of the new grading system. In judging these numbers, keep in mind that the grading system affected graduates in the class of 2001 for one year, and graduates in the class of 2002 for two years, etc. (It is actually more complicated than that because the law school has part-time students who complete their degrees in four years.)

Class of	75th	50th	25th
2001	3.378	3.128	2.880
2002	3.435	3.234	3.004
2003	3.438	3.170	3.052
2004	3.504	3.224	3.007
2005	3.472	3.225	3.068

The only anomalous year is the class of 2001, which was under the new grading system for only one year. This makes it unlikely that the change in grading system was responsible.

Here are the grade-point averages for all students for the eight semesters preceding the change:

Fall 1997	3.107
Spring 1998	3.193
Fall 1998	3.118
Spring 1999	3.226
Fall 1999	3.254
Spring 2000	3.295
Fall 2000	3.233
Spring 2001	3.294

Here are the corresponding numbers for the eight semesters following the change:

Fall 2001	3.205
Spring 2002	3.233
Fall 2002	3.227
Spring 2003	3.248
Fall 2003	3.200
Spring 2004	3.293
Fall 2004	3.232
Spring 2005	3.315

There is a decrease in grades in the first year that the system took effect. This may be a result of faculty discussion at this time about grade inflation. While this did not result in any formal action, an atmosphere was created in which at least some faculty began to become more conscious of their grading. In any case, the decrease was temporary, and grades have increased under the new system. (Notice the spring of 2005, when for the first time, grades exceeded the 3.3 level.)

It may also be interesting to see how grade distributions are altered by the change in system. Here are statistics for the two semesters preceding and following the change showing the percentage of each grade:

	Fall 2000	Spring 2001	Fall 2001	Spring 2002
A+ (4.5)	2.9	4.1		
A+ (4.33)			3.6	4.8
A (4.00)	21.1	22.4	14.0	15.2
A- (3.67)			14.1	15.1
B+ (3.50)	25.9	28.4		
B+ (3.33)			22.1	20.7
B (3.00)	30.8	27.9	23.0	21.0
B- (2.67)			11.2	10.6
C+ (2.50)	11.1	10.8		
C+ (2.33)			6.3	6.6
C (2.00)	6.6	5.0	3.3	3.7
D- (1.67)			1.5	1.3
D+ (1.50)	0.7	0.8		
D+ (1.33)			0.3	0.6
D (1.00)	0.8	0.7	0.5	0.2
F (0.00)	0.2	0.3	0.3	0.1

As you can see, the number of grades of A (4.0) dropped by 7.1 percentage points (from 21.1% to 14.0%) from the fall of 2000 to the fall of 2001. At the same time, the new A- (3.67) accounted for 14.1% of grades. (The total of A+'s increased from 2.9% to 3.6%, though this increase does not signal any shift in grading, since A+ was already in the grading system.) This means that (excluding A+), the total number of As in the fall of 2000 was 21.1% and the total number of As/A-'s in the fall of 2001 was 28.1%, an increase of 7.0% in the number of As/A-'s. This increase suggests that 7.0% of grades shifted up from 3.5 B+'s to 3.67 A-'s. Grades of 3.3 B+ were less than those of 3.5 B+; this tends to show that more 3.5 B+'s changed to A-'s than decreased to 3.3 B+'s. This would indicate that a shift in system brings about a change in grading patterns that tends to eliminate any overall change in student grade-point average.

Appendix A

Grade	Fall 1995-96		Fall 1996-97		Fall 1997-98		Fall 1998-99		Fall 1999-2000		Fall 2000-2001	
	# Awarded	% Awarded	# Awarded	% Awarded	# Awarded	% Awarded	# Awarded	% Awarded	# Awarded	% Awarded	# Awarded	% Awarded
A+	4,615	6.23%	4,617	6.33%	4,288	6.09%	3,974	5.71%	4,612	6.62%	5,014	7.13%
A	19,763	26.70%	20,072	27.54%	19,904	28.28%	20,255	29.10%	20,543	29.47%	21,916	31.18%
B+	10,873	14.69%	10,763	14.77%	10,678	15.17%	10,886	15.64%	10,735	15.40%	10,727	15.26%
B	15,089	20.38%	14,827	20.34%	14,410	20.47%	14,456	20.77%	14,103	20.23%	13,931	19.82%
C+	6,791	9.17%	6,606	9.06%	6,266	8.90%	6,017	8.64%	5,997	8.60%	5,878	8.36%
C	7,849	10.60%	7,889	10.82%	7,232	10.28%	6,972	10.02%	7,082	10.16%	6,386	9.08%
D+	1,992	2.69%	1,850	2.54%	1,815	2.58%	1,700	2.44%	1,637	2.35%	1,534	2.18%
D	2,589	3.50%	2,488	3.41%	2,263	3.22%	2,155	3.10%	2,032	2.91%	1,895	2.70%
F	4,464	6.03%	3,782	5.19%	3,528	5.01%	3,197	4.59%	2,976	4.27%	3,017	4.29%
Total:	74,025		72,894		70,384		69,612		69,717		70,298	
Mean Grade:		2.96		3.00		3.02		3.05		3.07		3.11

Grade	Fall 2001-2002		Fall 2002-2003		Fall 2003-2004		Fall 2004-2005		Fall 2005-2006	
	# Awarded	% Awarded	# Awarded	% Awarded	# Awarded	% Awarded	# Awarded	% Awarded	# Awarded	% Awarded
A+	4,649	6.64%	5,033	7.11%	5,549	7.86%	5,387	7.86%	5,363	7.75%
A	16,899	24.12%	16,732	23.65%	16,971	24.05%	16,013	23.35%	16,304	23.56%
A-	7,517	10.73%	8,476	11.98%	8,239	11.68%	8,493	12.39%	8,575	12.39%
B+	8,644	12.34%	8,449	11.94%	8,264	11.71%	8,479	12.36%	8,165	11.80%
B	10,686	15.25%	10,587	14.97%	10,711	15.18%	10,325	15.06%	10,387	15.01%
B-	4,766	6.80%	5,085	7.19%	5,038	7.14%	4,724	6.89%	4,808	6.95%
C+	4,363	6.23%	4,279	6.05%	4,215	5.97%	4,004	5.84%	4,059	5.87%
C	5,144	7.34%	4,909	6.94%	4,722	6.69%	4,540	6.62%	4,568	6.60%
C-	1,682	2.40%	1,705	2.41%	1,667	2.36%	1,603	2.34%	1,559	2.25%
D+	1,090	1.56%	1,106	1.56%	1,028	1.46%	994	1.45%	958	1.38%
D	1,415	2.02%	1,314	1.86%	1,218	1.73%	1,171	1.71%	1,362	1.97%
D-	459	0.66%	488	0.69%	469	0.66%	446	0.65%	444	0.64%
F	2,752	3.93%	2,577	3.64%	2,470	3.50%	2,395	3.49%	2,641	3.82%
Total:	70,066		70,740		70,561		68,574		69,193	
Mean Grade:		3.05		3.07		3.09		3.10		3.08

Appendix B

Here are comments from other registrars:

- Ohio State moved to plus/minus grades in 1975. The registrar does not remember any analysis that would indicate any decrease in grade-point averages.
- The University of Colorado made the shift in the mid-1980s without any apparent concerns before or after.
- The registrar at the University of Pittsburgh reports: “We have been doing plus/minus grading since 1976. We haven't noticed an appreciable change in the distribution of grades or mean GPA that could be attributed to it.”
- Emory reports that it has been on the plus/minus system for “quite a while” and the registrar comments, “I have no evidence that there has been any change in GPAs attributable to this system.”
- Penn State changed to a plus/minus system over a decade ago. “Overall, no measurable change in GPA. Some individual students have complained about their GPA being lower.”
- Iowa State went to a plus/minus system in 1981. “No noticeable change due to the +/-.”
- UCLA adopted a plus/minus system in 1975. The registrar comments,

“Let me focus first on what happened in [undergraduate upper-class] courses. The immediate effect was to shift about 1/4 of all A grades to A-grades. At the same time, however, about 1/4 of B grades shifted to B+ grades. Since overall numbers of A and B grades were about equal at the time of the change, the numbers of grades shifting up and down were about the same, so there was no net effect at the A/B border on overall average GPA across the student population. About 1/5 of B grades shifted to B- grades while about 1/4 of C grades moved up to C+. But since B grades outnumbered C grades by about 2 to 1 at the time of the change, there were more grades moving down than up, and the net effect at the B/C border was to slightly depress overall average GPA.

“Note, however, that more B grades shifted up to B+ (1/4) than down to B- (1/5). A similar pattern of up/down shifting also occurred within the C grade range, actually even a bit more unbalanced, with about 1/4 of C grades shifting up to C+ and about 1/6 shifting down to C-. The net effect of these two patterns within grade range was to elevate overall average GPA, and this served to balance out the depressing effect at the B/C border caused by the underlying difference in the numbers of B and C grades to start with. There were no changes worth noting at the D and F grade levels. The availability of the D- grade did not have any apparent effect on the awarding of the F grade.

“All in all, the immediate effect was a WASH. The overall average upper division course grade index in the year before the change, calculated on an ABCDF basis, was 2.99. For

the first five years following the change. This index stayed within a range from 2.99 to 3.01. And – more significant perhaps – the average calculated out almost exactly the same value in this same tiny range whether computed on the new A/A-/B+/... basis or on the old ABCDF basis (by treating A- grades as if they were still A grades, B+ and B- grades as if they were still B grades, etc.). This can be interpreted to mean: No net effect of the plus/minus system.

“In lower-class courses, the underlying patterns were similar, but precise proportions and effects differed somewhat in the initial distribution of full letter grades and in the fractions of these grades that shifted up or down. Grades actually went up slightly.”

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