Overview

Most studies I have located recommend the plus/minus system. It is likely that the students’ first concern will be a lowering of their GPAs. According to studies conducted elsewhere, there may be some decrease but the effect appears to be slight (more below). What follows is largely a compilation of other studies and resources available online.

Arguments in favor

Accuracy and fairness

Plus/Minus provides faculty with a finer grading mechanism that more accurately reflects the level of student performance. Allows for more nuance and precision in the evaluation process.

- A five letter system inflates weaker performances: e.g., B- work is accorded the same final grade as B+ work, whereas instructors see a significant difference between these two levels of performance.

- There is a larger interval within a grade than there is between grades (e.g., everything between 80 and 88 or 89 = B, and only one point between 79 and 80, C and B. This latter borderline is often crucial).

- With five letter grades there is too much: “grouping error.” The fundamental argument against the simple letter-grade system is that, because it allows only 5 possible grades, it allows for too much grouping error. To
simplify a bit, grouping error occurs because the mean [average] of the actual grades within an interval will be lower than the mean of the interval. Here is an example. Suppose that a professor is computing grades on a 0-100 system, that grades are distributed on a bell curve with a maximum at 75, and that everyone who earns a score greater than or equal to 80 and less than 90 receives a B. In effect, all those who are given a B are given the same grade of 85 (the midpoint between 80 and 90). But given the overall grade distribution, there will be more grades below 85 than above 85. So if one averaged the numerical scores that the professor used to do the grading, this average would be less than 85. The grouping error is the difference between the grade reported to the Registrar (in this case, 85) and the actual average of those in that grade interval. For any group of students, the effect of grouping error is to inflate the performance of weaker students and reduce the reliability of grading. For any particular given reliability of the grading basis, one can compute the reliability for grading systems with different possible numbers of grades.

? See appendix “The Views of Measurement Experts” for reasons why plus/minus grading can achieve greater grading reliability.

**Encouraging better student performance.**

Toughens standards at the highest grade levels while encouraging students to perform better because the next higher grade level is more easily within reach than in a system without pluses and minuses. There is more incentive to continue to work through the end of the semester. Also students who don’t think they can reach the higher grade may still wish to get a + rather than a – grade.

More informative feedback to students.
GPA

There does not appear to be any evidence of plus/minus grading lowering overall GPAs by any appreciable amount. There is reported to be some (as yet tentative) evidence that the overall GPA rises more slowly in institutions using plus/minus: i.e., +/- may reduce grade inflation.

Report from North Carolina State on GPA (one of most often cited)

The effect on GPA of +/- was calculated by starting with the actual GPA and subtracting a GPA computed by removing all +’s and -’s and assigning a numerical value to the resulting grade. A negative difference implies that the actual GPA using +/- grading is lower than it would have been without +/- grading. In this case, the student received more - than +. A positive difference implies that the actual GPA using +/- grading is higher than it would have been without +/- grading. In this case, the student received more + than -. Of course there is no way of knowing if a B+ would have been a B instead of an A. The assumption is that a B+ would have been a B.

The majority of students showed no difference in this calculation. Plus/minus grading produced a lower GPA for about 11% of the graduate students and 11% of the undergraduate students in fall 1994, 15% of the graduate students and 33% of the undergraduate students in spring 1995, 20% of the graduate students and 33% of the undergraduate students in fall 1995, 20% of the graduate students and 34% of the undergraduate students in spring 1996, and 22% of the graduate students and 34% of the undergraduate students in fall 1996.

The group with a higher GPA using +/- grading has also increased over time starting with 7% of graduate students and 8% of undergraduate students in fall 1994, increasing to 11% of graduate students and 23% of undergraduate students by fall 1996.
NC State summary:

From a Truman State Report:

Studies (e.g., Wake Forest and NC State) show that while plus/minus grading generally has little effect on student GPAs, GPAs may decrease very slightly in a plus/minus system. For instance, the mean undergraduate GPAs from the six semesters NC State has been using a +/- system are within four hundredths of a point of what they would be under a simple letter grade system. The Wake Forest study indicates that the GPAs of students with GPAs close to 4.0 may decrease by up to eight hundredths of a point. Students with GPAs in the D- range may also have GPAs reduced by a tenth of a point or so.

The small decrease in near-4.0 GPAs can be made even smaller with the adoption of a 4.333 A+ grade (together with a cap on cumulative GPA of 4.0, if desired).
A new system could possibly aid students who do get a **4.0** when competing with students from a school with plus/minus 4.0. The latter would be viewed as a stronger grade point average than that from a school without plus/minus. Don’t have any evidence to prove or disprove this supposition.

**Problems or arguments against**

**GPA**

Could be **fewer 4.0s**, because of A-. Hurt graduate job prospects?

If C- is 1.667 then students who would otherwise have received a C grade (2.0) could now receive a low enough grade to find themselves on **academic probation**. Is this a problem?

*Current RPI policy: “A student whose quality point average for any term falls below 1.50 is placed on academic probation automatically. In addition, any student whose cumulative quality point average falls below the following specified averages is automatically placed on probation: freshmen--1.50 at the end of the fall term or 1.60 at the end of the spring term; sophomores--1.70 at the end of the fall or spring term; juniors and seniors--1.80 at the end of the fall or spring term.”*

**Recruitment**

If fewer 4.0’s could RPI see a drop in incoming students?

Possibly more student **appeals** (no evidence cited).

Perhaps more **clerical errors** because there are more bubbles on grade sheets? (other reports raised this possibility: no evidence cited).
Current Status in other Institutions

See tables compiled by ASU and U of Maryland.
CMU has recently undergone a trial of the plus/minus system.
I understand.

Questions on Implementation

If plus/minus grading were to be adopted:

? Should it be **phased in** or implemented all at once? For example, apply only to new students as they matriculate or to all students on campus?

? Begin, say, **next year** or at some later date?

? Apply to both **graduates and undergraduates**?

? Should plus/minus grades appear on **transcripts**? Should they not affect the **final GPA**? (MIT)

? **A+** or only A as top grade?

Background:
89.8% of U.S. colleges and universities use a 4.0 scale (according to the Georgia State University study). Several schools count both an A and an A+ (assuming they have the A+ grade) as a 4.0 (see U. of Maryland chart).
One alternative suggestion (University of Cincinnati) is to include a 4.333 grade for an A+, but to cap the cumulative GPA at 4.0. This proposal preserves parity between the number of pluses and minuses in the grading system. At the same time, it allows the standard 4.0 scale shared by most universities to be maintained. Wake Forest’s study also shows that under a +/- system that included a 4.333 A+ grade, the decrease in near-4.0 GPAs (as the result of moving to a +/- system) would be even smaller than it would be without the 4.333 A+.

? Exactly what **numerical score** should be assigned to each grade? (e.g., is A- 3.7 or 3.667?)

? Is there any problem at the **C level**?
**Sample proposal:** Western Kentucky University.

Whereas a plus/minus grading system has been shown to increase student effort;
Whereas a plus/minus grading system will increase grading accuracy;
Whereas a plus/minus grading system will increase grading fairness;
Whereas 18 of the top 20 schools (as defined by US News and World Report) have a plus/minus grading system and many other schools are moving toward this system;
Whereas many new faculty to WKU have had experience with the plus/minus grading system and have preferred it to Western’s current grading system;
Whereas the below grading system is the most often used among schools which have a plus/minus grading system;

I hereby propose that the University Senate recommend that Western Kentucky University adopt the following grading system to be implemented in the fall of 2004:

\[
\begin{align*}
A+ &= 4.0 \\
A  &= 4.0 \\
A- &= 3.7 \\
B+ &= 3.3 \\
B  &= 3.0 \\
B- &= 2.7 \\
C+ &= 2.3 \\
C  &= 2.0 \\
C- &= 1.7 \\
D+ &= 1.3 \\
D  &= 1.0 \\
D- &= 0.7 \\
F  &= 0.0
\end{align*}
\]