The Determination of Course Grades

Robert L. Wardrop, Emeritus Professor
Department of Statistics, UW–Madison

January 4, 2014

1 Accumulating Points

During the semester you will have several opportunities—described below—to earn points. At the end of the semester your points are totaled and your course grade is a function of your total number of points. The maximum number of points possible is 200, as detailed in Table 1. Below I will discuss the six categories of points in this table.

1.1 The Midterm and Final Exams

The midterm exam will cover Chapters 1–9 of the Course Notes. The final exam will cover Chapters 10–22 of the Course Notes. The final is not cumulative; it will not cover the material in Chapters 1–9.

There will be three different times at which you will be allowed to take the midterm exam; at this time my guess is that the three options will be:

- Late afternoon/early evening of Wednesday, March 5;
- Late afternoon of Thursday, March 6; and
- Early evening of Thursday, March 6.

<table>
<thead>
<tr>
<th>Source</th>
<th>Points</th>
<th>Source</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Exam</td>
<td>100.0</td>
<td>Homework</td>
<td>5.4</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>60.0</td>
<td>Project 1</td>
<td>4.0</td>
</tr>
<tr>
<td>Quizzes</td>
<td>27.0</td>
<td>Project 2</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200.0</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2: The 12 quizzes. The deadline for each quiz is 11:59 PM on the date (always a Wednesday) given.

<table>
<thead>
<tr>
<th>Quiz No.</th>
<th>Covers Chapter(s)</th>
<th>Deadline</th>
<th>Quiz No.</th>
<th>Covers Chapter(s)</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 and 2</td>
<td>Jan 29</td>
<td>7</td>
<td>12</td>
<td>Mar 26</td>
</tr>
<tr>
<td>2</td>
<td>3 and 4</td>
<td>Feb 5</td>
<td>8</td>
<td>13 and 14</td>
<td>Mar 26</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>Feb 12</td>
<td>9</td>
<td>15</td>
<td>Apr 2</td>
</tr>
<tr>
<td>4</td>
<td>6 and 7</td>
<td>Feb 19</td>
<td>10</td>
<td>16</td>
<td>Apr 9</td>
</tr>
<tr>
<td>5</td>
<td>8 and 9</td>
<td>Feb 26</td>
<td>11</td>
<td>17</td>
<td>Apr 16</td>
</tr>
<tr>
<td>6</td>
<td>10 and 11</td>
<td>Mar 12</td>
<td>12</td>
<td>18</td>
<td>Apr 23</td>
</tr>
</tbody>
</table>

Sometime in February the class will vote to select exact times for the three options.

The final exam is scheduled (by the University) for 5:05–7:05 on Thursday, May 15. Two earlier time/day combinations also will be available, chosen by a vote of the class.

If you have authorization from the McBurney Center for additional times on exams, contact me early in the semester so that arrangements can be made. Note that such accommodations also will apply to the quizzes described below.

Both exams will be taken in-person; contact me if this will be a hardship for you. The exams will be closed book; you will need to bring: a calculator with a square root button, writing utensils and your WISCARD photo id. At each exam I will distribute four to six pages of notes for you to use. At least one week before the exam, I will post a copy of the notes for the exam; obviously, you won’t need to memorize anything that is in the notes.

I will post practice exams, with solutions, for both the midterm and final. I will conduct an in-person review a few days before each exam.

1.2 The Quizzes

There will be 12 online quizzes, scheduled as shown in Table 2 (Recall that March 15th to the 23rd is Spring Break.) Note that quizzes 7 and 8 have the same deadline.

Each quiz will be worth three points. Your three lowest quiz scores will be dropped, yielding

\[9 \text{ (quizzes)} \times 3 \text{ (points per quiz)} = 27 \text{ (points)},\]

as listed in Table 1.

The questions on the online quizzes primarily will consist of the types: short answer—usually a number; matching; and on rare occasions, multiple choice. Most questions will require some computation. Thus, when you take an online quiz, you should have a calculator with a square root button, writing utensils and some scratch paper available. Also, you may use your notes during the quizzes. You will not need access to any websites—other than taking it on Learn@UW—during any quiz.
Table 3: Student mean scores (percentage) for the 12 quizzes, Fall 2013.

<table>
<thead>
<tr>
<th>Quiz Number</th>
<th>2</th>
<th>3</th>
<th>6</th>
<th>10</th>
<th>8</th>
<th>1</th>
<th>12</th>
<th>4</th>
<th>9</th>
<th>5</th>
<th>7</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean score</td>
<td>91</td>
<td>88</td>
<td>85</td>
<td>79</td>
<td>78</td>
<td>76</td>
<td>76</td>
<td>75</td>
<td>74</td>
<td>71</td>
<td>71</td>
<td>62</td>
</tr>
</tbody>
</table>

You may not talk to your classmates, friends, acquaintances, total strangers, anybody about any quiz until after its deadline for completion has passed.

Note that quizzes end after Chapter 18. Chapters 19–22 are covered on the final exam, but I want you to have additional study time—withouth the burden of quizzes—during the final two calendar weeks of the course.

There is a 40 minute time limit on each quiz.

When I taught this course in Summer and Fall 2013, the two lowest quiz scores were dropped. This semester, as noted above, the three lowest scores will be dropped. In the past, the most common strategy among students seemed to be: take every quiz, even if you aren’t prepared for it. Several students, however, did quite well with the following strategy: simply don’t take two quizzes. If you are considering the latter strategy, you should definitely examine Table 3 in particular, quizzes 2, 3 and 6 yielded the highest mean scores, while quiz 11 was extremely difficult.

The remainder of this subsection is very important; please read it carefully and remember it! Your quiz is machine-graded and you will receive your machine-graded score almost immediately upon completion of each quiz. (You will not have access to the solutions to the quiz until I post them after the quiz deadline.)

After your quiz is machine-graded, I will verify the grading by inspecting your answers. Very often my inspection results in your being awarded extra points. Here is why:

1. The machine-grader, while good at following precise instructions, has no flare for interpretation. For example, suppose the correct answer is 0.75 and I tell the machine-grader that the answer is 0.75. With these instructions, the machine-grader will mark each of the following perfectly acceptable responses as wrong:

   \[
   \frac{3}{4}, \frac{6}{8}, \frac{9}{12}, \ldots, .75, 0.750, 0.7500, \ldots
   \]

2. The machine-grader is not good at giving partial credit. For example, you will calculate lots of intervals in this class—namely, many types of confidence and prediction intervals. Suppose that the correct interval is [40,60], alternatively in a form popular with statisticians and some scientists: 50 ± 10, the interval centered at 50 with half-width equal to 10. In order to assist the rather dull machine grader, I will ask you for two separate answers: the lower bound is 40 and the upper bound is 60 are correct for my example. If, however, your answer is “Lower bound is 30 and upper bound is 70,” the machine grader will give you no credit. Being more compassionate than the machine grader, I will give you partial credit because you have the center, 50, correct.

Note that I will not regrade your quiz immediately! Almost always, I have been able to regrade each quiz within 24 hours of its submission. (Thus, if you submit it at 2:00 AM on Tuesday, the
regrade should be complete no later than 2:00 AM on Wednesday.) Therefore, wait at least 24
hours before you send me your “The computer made an error” email. Please.

There is one other issue that often arises with the machine-grading of quizzes. Suppose that a
multiple choice question provides options A, B and C, with C being the correct answer. I might
decide that wrong answer A is better than wrong answer B and, thus, instruct the machine-grader
to give, say, 40% of credit for answer A. If I do so, then there is a problem: the machine-grader
does not tell you that your answer, A, is wrong and that you have received partial credit; it
simply gives you partial credit. The result? I receive lots of emails stating, “My answer is correct,
but I did not receive full credit; please fix this.” If this happens to you, please wait until I have
posted detailed solutions to the quiz. (In fairness, I should state that many previous students have
ignored this plea. Oh, well.)

1.3 Homework

There will be 20 homework assignments, one each for Chapters 1–20 of the Course Notes. The due
dates for the homework are given in Table 4. You will be submitting your homework electronically
to a dropbox on Learn@UW.

After you submit a homework assignment, you will have immediate access to its solutions. At
12:01 AM on each Monday, the solutions for the week’s homework will be posted on Learn@UW.
Thus, even if you do not submit a homework assignment, you will still have access to its solutions.

If you want to submit homework late, place it in the next available dropbox and email your
TA. Give him (both TAs are male) your reason(s) for requesting a waiver of the deadline. Do not
contact me about homework issues unless you want me to mediate a dispute between you and
your TA.

Your TA will examine your homework carefully and give you feedback on any incorrect an-
swers. The feedback might consist of: referring you to the posted solution; providing additional
detail (beyond what is posted); or a suggestion that you talk to him at discussion or during an office
hour.

If it appears that you made a good effort to complete the homework problems, you will receive
0.3 points for your submission, regardless of whether it is totally correct, partially correct or totally
incorrect. The main reason for my casual approach to rewarding homework points is that I want
Table 5: The frequency distribution of course grades in online Statistics 371 in Fall, 2013.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Freq.</th>
<th>Grade</th>
<th>Freq.</th>
<th>Grade</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>37</td>
<td>B</td>
<td>28</td>
<td>C</td>
<td>2</td>
</tr>
<tr>
<td>AB</td>
<td>14</td>
<td>BC</td>
<td>10</td>
<td>I</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>92</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

to encourage students to work together on homework; by definition, it is impossible to cheat on the homework.

We will drop your two lowest homework scores. Thus,

$$18 \text{ (homework assignments)} \times 0.3 \text{ (points per assignment)} = 5.4 \text{ (points)},$$

as listed in Table 1.

1.4 Projects

You should submit reports for each of two projects. Details of the projects are provided in another document. The first project report must be submitted electronically on or before 11:59 PM on Sunday, March 30. The second project report must be submitted electronically on or before 11:59 PM on Sunday, May 4.

The maximum score on project 1 [2] is 4.0 [3.6] points. Late project reports will be accepted, but they will lose 0.4 points for every 24 hours, or portion thereof, that they are late.

2 Determination of the Course Grade

In Fall, 2013, 104 students took the first quiz. The distribution of grades at the end of the semester is given in Table 5. In the following discussion, I will ignore the student who has received an incomplete. Note that 40.6% of the students (37 of 91) received an A. This is a high percentage by Statistics Department standards, but I felt this was justified for the following reasons:

- Twelve is a large number of drops out of 104 students; this suggests, perhaps, that the online medium is more difficult for weaker students. The 91 survivors should not be punished because 12 lower grades have been removed from the distribution.
- I was impressed that the class, as a whole, worked very hard.

Also, note that nobody received a D or an F.

In any event, I am not willing to state exactly what the distribution of grades will be this term, nor am I willing to say anything like, “A total of X points guarantees an A.”
2.1 Summary

Notice from Table 1 that 80% of the points available (160 of 200) are from the two in-class exams. The 27 points from quizzes as well as the 5.4 points from homework are designed to reward students for keeping up in the class. Finally, the 7.6 points from projects provide an incentive to apply the course material to topics of interest to you.

I cannot stress enough the importance of homework and the two projects. In Fall 2013, the highest B was only 7.05 points below the lowest A; thus, failure to submit the two projects could have resulted in a course grade changing from A to B! To be fair, the highest B was 20.85 points above the lowest B; thus, scoring zero on the homework and projects combined might have no effect on one’s course grade!