STAT 209, SUMMER 2021: GRADING SYSTEM

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60% of the the final grade will be based on mastery of specific learning objectives as demonstrated on labs, quizzes and projects. See the accompanying "Grading System" handout for details on how this gets broken down.

30% will be based on good faith, timely completion of assigned work, irrespective of technical correctness

10% will be based on participation in providing peer feedback on draft projects

A Mastery-Based Grading System

The 'Content Mastery' portion of the grade will be based on a modified version of "Standards-Based Grading" or "Specifications Grading".

In this system the learning objectives for the course are laid out in advance, and each assignment is associated with a some number of these objectives. Rather than receiving a numerical grade for an assignment as a whole, a grade is assigned for each learning objective based on how well mastery of that objective has been demonstrated by that assignment.

At the end of the semester, an overall level of mastery for each objective is determined based on the individual grades attached to that objective, generally using only the top two or three, and the overall mastery grade for the course is simply the average mastery level across all learning objectives.

This way, as you progress through the course, as particular content is revisited and your level of mastery increases, your course grade will primarily reflect your final level of mastery, rather than being an average of different mastery levels at different points in time.

You can think of this as being similar in spirit to dropping the lowest quiz grade and dropping the lowest homework grade, except that instead of dropping an assignment grade, the dropped grades are the lowest associated with each learning objective, which may come from different assignments.

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Some advantages of this approach are that:

- **"key concepts and proficienies" are listed up front**, so it should be clearer as you go what the most essential takeaways are
- you will be able to **monitor your learning in terms of concepts and skills** rather than abstract "point totals"
- if a student has a slower start picking up on a particular concept, **early struggles need not impact the end grade** at all provided they get where they need to be in the end
- it incentivizes **engagement with mistakes** so you can learn from them, rather than focusing on content you already know well
- I can more easily track who needs work in what areas, and what topics are most difficult for the class as a whole (and allocate review time and extra homework or quiz problems accordingly).

Downsides are that

- the system is unfamiliar to most and takes some getting used to
- a snapshot of your apparent course grade at any given moment in time will tend to be lower than the final grade: since by design, the more assignments that are completed, the more low grades get dropped, and so there is expected to be an **upward trend** in the running average, as higher scores replace lower ones

I will provide you with periodic "grade reports" where the aggregating calculations have been done, where you can fill in "possible futures" to see how potential future grades might impact the course grade

Summary of Grading System

- **Each graded item** (lab, quiz, project) **is associated with one or more SLO** (Specific Learning Objective). There are 20 SLOs in total for the course.
- For each SLO for each graded item, a grade between 0 and 8 will be assigned, based on the level of mastery of the concept/proficiency represented by the SLO (see the rubric on the following page)
- The SLOs are grouped into six content areas, each of which has 3-4 SLOs associated with it.

- **A mastery score is tracked for each SLO**, which is **the average of the final project grade, the highest group project grade, and the highest lab or quiz grade** associated with that SLO. For SLOs that do not appear on one of these components, only two grades are used.
- **The final SLO grade** (60% of the overall course grade) is simply **the average of the 20 individual SLO grades**. In other words, each SLO constitutes 3% of the final grade.
- Another 30% of the course grade is based on "good faith effort" to complete **labs (15% total, 1% each)**, **quizzes (5% total, 1% each)** and **group projects (10% total, 5% each)** in a timely and (where applicable) constructively collaborative manner.
- The last 10% of the course grade is based on participating in the peer feedback process (5% from each of the group projects)

Levels of Mastery

Levels of mastery per item per SLO are on an 8 point scale:

8	demonstrated **comprehensive mastery** of the concept or skill, including subtle nuances and peripheral details
7	demonsrated of **mastery** of both the big picture and most of the details, with only minor errors either in inessential details or in the finest nuances of the concept. Basically, "A" level work.
6	demonstrated mastery of the **essential components** but with some details or stylistic elements missing. Solid "B" level work
5	**solid progress** toward mastery, but needs some further attention to firm up the ideas ("C" level work)
4	**elements of mastery** are present in the response, but don't yet form a coherent whole ("D" level work)
2	some evidence of a **superficial grasp of some ideas**. Not yet "passing level" work, but better than nothing
0	**no meaningful evidence of engagement** with the ideas in question

Final Grade Determination

The final Mastery component of the grade is a simple average of the 20 individual SLO grades, on a 0-8 point scale.

The completion components for minor assignments (labs and quizzes) will be determined by recording a 1 for each assignment completed by the deadline, a 0.5 for each assignment which is complete but handed in late or on time but missing substantial content, and a 0 otherwise. If 18 labs are assigned and completed as planned, the three lowest lab completion grades are dropped. In the event that we get through fewer than 18 labs, whatever number is in excess of 15 will be dropped. If the optional quiz is completed, the lowest of the six quiz completion grades is dropped, otherwise all five quiz grades count.

The completion component for the group projects will be graded on a 0-5 scale, 1 for the group as a whole as determined by the median peer grade, 2 for your individual contribution to the project as assessed by your group members, and 2 for a final writeup that satisfies the basic assignment requirements.

The peer feedback grade will be assigned by the members of the group whose project is being graded, with 4 points for providing feedback by the deadline, and 1 point based on the usefulness of the feedback.

Both the completion and peer feedback components are converted proportionally to the same 8 point scale used for the SLOs, and then the three components are averaged together according to the weights given.

The overall grade on the 0-8 point scale is converted to a letter grade at the end of the semester roughly as follows:

A	7.20-7.99
A-	6.80-7.19
B+	6.40-6.79
B	6.00-6.39
B-	5.60-5.99
C+	5.20-5.59
C	4.80-5.19
C-	4.40-4.79
D	4.00-4.59

Grading Example

In reality there are 20 SLOs in the course, but for the sake of illustration, suppose there were only 6; call them Z1 through Z6.

Suppose the student Bo Sample has the following grades:

Lab 1:
- Z1: 4
- Z2: 5
- Z3: 7

Lab 2:
- Z2: 6
- Z3: 8
- Z6: 7

Quiz 1:
- Z1: 8
- Z2: 4
- Z3: 6

Quiz 2:
- Z2: 4
- Z3: 6
- Z4: 8

Project 1:
- Z1: 7
- Z2: 6
- Z3: 5
- Z4: 4

Project 2:
- Z1: 6
- Z2: 7
- Z3: 5
- Z4: 4
- Z5: 4

Final Project:
- Z1: 8
- Z2: 8
- Z3: 6
- Z4: 5
- Z5: 5
- Z6: 6

SLO Z1 appears a total of 5 times. The final project grade is 8. The two group project grades are 6 and 7, so the 7 is used. The two lab and quiz grades are 4 and 8, so the 8 is used. Therefore the final grade for Z1 is the average of 8, 7 and 8, or 7.67.

Bo has a 6, a 4 and a 6 on Z2 for Labs and Quizzes, so we use a 6. Their project grades for Z2 are 7 and 6 so we use the 7. The final project grade is an 8. So the final grade for Z2 is the average of 6, 7, and 8, which is 7.0.

Z3 appears on all four labs and quizzes; the highest mark is an 8. The group project grade is 5, and the final project grade is 6, for an average of 6.33.

Bo has an 8, a 4 and a 5 for Z4, for an average of 5.67.

Z5 only appears on Project 2 and the Final Project, so the grade is just the average of the 4 and the 5, for 4.5.

Finally Z6 only appears on the Final Project and Lab 2, for an average of 6.5.

All together, Bo's SLO grade is the average of 7.67 (Z1), 7.0 (Z2), 6.33 (Z3), 5.67 (Z4), 4.5 (Z5), and 6.5 (Z6), which is 6.28, putting them in "B" territory for that part of the grade.

Suppose Bo completes 16 out of 18 labs but turns in two of them late, both of the missed ones and one of the late ones are dropped, leaving them with a lab grade of 14.5 out of 15.

They miss two quizzes but do the other three and the optional quiz on time, their grade for quizzes is 4 out of 5.

Bo is an active participant in Project 1 earning full marks (2 out of 2) from their group mates, the draft project is rated 4/5 (or 0.8 out of 1) by the peer graders, and the final project satisfies all the requirements (for 2/2), then Bo's completion grade for Project 1 is 4.8.

Bo gets busy later in the semester and misses some group meetings for Project 2, earning a 1 out of 2 from their group members. The rest of the group picks up the slack, turning in both a complete draft and a complete final writeup on time. Bo's completion grade for Project 2 is then 4.0.

All together, Bo's completion grade is $14.5 + 4.0 + 4.8 + 4.0 = 27.3$ out of 30, which becomes 7.28 out of 8.

Meanwhile, Bo provides useful and timely feedback on another group's Project 1, but forgets to turn in any peer feedback for Project 2, thus earning a total of 5 out of 10 for that component, which becomes 4 out of 8.

So Bo's final grades are 6.28 for SLOs (weighted 60%), 7.28 for completion (weighted 30%) and 4.0 for peer feedback (weighted 10%), giving them a final grade of 6.35, which is a solid B.