



Quantitative Reasoning, Lessons from Fall 2021

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Fall 2021 was a challenging semester. COVID was a backdrop. Students fell ill and needed to be in quarantine. Others were exposed to Covid, or needed to help out at home.

I modified Quantitative Reasoning, Math 114QR with 10 steps to help students keep up with their work despite being absent from the classroom. I developed these steps over several weeks early in the semester after a student who tested positive for COVID asked me how he could keep up with the class from home. I gradually expanded it to all students who were unable to attend class in person due to family and personal reasons.

1. Gave all students the option to attend the class online.
 - a. I broadcast the class live from the classroom using Blackboard's Web Conferencing Feature.
 - b. I bought an inexpensive web camera which allowed me to cover more of the classroom.
 - c. While I primarily focused on the students in the classroom, I asked QR's in-class tutors to work with the remote learners online on their personal laptops responding to questions in the chat area and by holding some discussions using the JamBoard application. (Most sections of Quantitative Reasoning have in-class tutors. This is possible because QR charges a lab fee and has in-class tutors.)

2. I uploaded videos I had made during the last two years of remote teaching and added new ones as needed. I find making short five-to-ten-minute videos are preferable to

recording a class because a student can select the topic they wish to view, or they can view them all.

3. To accommodate students' schedules, I held virtual office hours on evenings and weekends.
4. I encouraged students to exchange contact information and work on homework assignments together.
5. I accepted late homework as students needed extra time to recover from being ill.
6. Students could take makeup exams provided they requested permission and had a legitimate reason.
7. I created three bonus homework assignments: one at the midterm and two at the end of the course. These completed assignments could serve as replacement for a missed homework assignment from earlier in the semester.
8. I provided video instructions so that students could complete in-class labs or experiments at home. For example, for explorations of probability, students could use virtual dice coins and more, rather than physical coins and dice. (See www.random.org, a website developed at the School of Computer Science and Statistics at Trinity College, Dublin, Ireland.)
9. I added high quality videos as supplements to the course textbook readings and wove some of them into homework assignments. Students learning from home reported my videos were helpful and enjoyable. (For example, here is one on the mathematics of Juggling: <https://www.youtube.com/watch?v=X1zSlvQtKM4>, by George Hart, Retired Professor of Electrical Engineering, Columbia University, and cofounder of the MoMath, the Museum of Mathematics in New York City. The concept here is mathematical equations are a language that describe reality and once creates can lead to new discoveries.)
10. Throughout the semester, I maintained a positive attitude, reminding students our goal was to learn math together. My grading philosophy is based on a student mastering work and successfully completing assignments. I let the students know that I understood it was a difficult time, and that getting to campus could be challenging. My message was a combination of high expectations and flexibility to achieve these goals.