

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **often**

Attend class: **always**

Participate in class: **always**

Complete assignments: **always**

Meet with professor(s) outside of class: **often**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

His lecture slides are comprehensive, intuitive, and tightly connected to the textbooks and the homework. I found first reviewing lectures and then doing the homework helped a lot in my learning.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

In every way from lectures, homework, exams, and materials - it's just simply fantastic. The class inspired me to pursue more Mathematics courses at Amherst.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

Critical thinking and reading Mathematic proof.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

Everything exceeded my expectations.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

Professor Alvarado was an incredibly supportive instructor and a genuinely kind individual. His approach to teaching, brimming with enthusiasm and a deep passion for Mathematics, inspired his students in ways he perhaps never fully realized. Through his guidance, students gained a profound impression of the Amherst Math department, perceiving it not just as an academic institution but as a vibrant community where they could be intellectually challenged, develop their potential, solve complex problems, and enjoy the journey of learning. I believe every student like myself would be grateful to have Prof. Alvarado as their professor.

Additional comments.

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **always**

Attend class:

Participate in class: **sometimes**

Complete assignments: **always**

Meet with professor(s) outside of class: **often**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Attending office hours, Q-fellow Hours and math fellow hours every week

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

Seeking help/resources outside of the classroom, drawing connections across chapters, synthesizing details into big pictures and reinforcing major topics

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

The pace in class was sometimes hard to follow because it seemed like a lot of information thrown at once. Also, I sometimes couldn't process all the definitions and theorems without concrete examples, not just proofs. These ideas were reinforced, though, in office hours whenever I had big ideas broken down and presented in a slower pace.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

Professor Alvarado is literally the best at communication and making all his students feel welcome and ready to learn. He was very widely accessible outside of class and helped calm nerves down during many stressful moments. This made me excited to come to class and hear lectures.

Additional comments.

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **sometimes**

Complete assignments: **always**

Meet with professor(s) outside of class: **often**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Attend office hours for every hw assignment

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

The professor helped me gain a better appreciation for pure math

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

I gained an understanding of matrix algebra

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

The pace was beneficial for my learning.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

The professor was readily available to meet, clear and concise in their feedback, and accommodating of students' needs.

Additional comments.

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1. How often did you:

Prepare for class: **often**

Attend class: **always**

Participate in class: **often**

Complete assignments: **always**

Meet with professor(s) outside of class: **sometimes**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Simply attending all the lectures and keeping clear notes on what we covered ended up being my core strategy. The lectures were very well structured and covered all the essential material. Even though I read the textbook every time before completing the homework assignments, there was usually little else to learn from it. The theorem and definitions sheets that Prof. Alvarado asked us to complete weekly were very helpful. I also believe that completing extra workout problems and problems from the textbook suggested by the professor was quite an effective strategy to prepare for the exams.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

As a result of taking the class, I discovered I really enjoy proofs. The problems given to us for HW were not unsolvable but difficult just enough to make me curious. I remember how my classmates and I spent half an hour during office hours a few weeks into the semester debating what was the best way to prove one of the properties of the vector spaces and their subspaces. Professor Alvarado gave us a few hints and let us finish the proof ourselves. That was fun))) And when I think about it now, I realize how much I enjoyed taking the class. The analogies that Prof. Alvarado drew between mathematical terms and everyday things definitely helped me think of math from a different perspective. I especially love the idea of the kernel characterizing how much information is destroyed by the linear map. My second favorite is the description of the linear transformation matrix as a garbage truck picking up a vector and throwing it back into a new environment.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

I developed my skills in writing proofs (especially those involving induction). I got fundamental knowledge of vector spaces and their properties, that will help me in future math classes. I learned to work with matrices as mathematical tools and perform basic operations with them. I developed the idea of linear maps and vector spaces being somewhat similar, so it turns out we can describe very obscure transformations on even more obscure vector spaces with simple and understandable matrices on \mathbb{R}^n . Finally, learning about eigenvalues, eigenvectors, and ways to use them helped me in the Physics class I'm taking, so I consider this knowledge a significant acquisition as well.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

I loved the structure of the class. As I mentioned before, the lectures were very well planned. I appreciate that Professor Alvarado took online notes during the lessons and shared them with us afterward. It helped me review the material on my own and prepare for exams. Quick side note: I loved the consistent use of different colors throughout the notes. By the end of the semester, I got used to theorems being black and comments - green. Next, I enjoyed the structure of the homework assignments. All the problems were appropriate, and I never had issues finding the

connection between the homework assignments and the class material. The extra problems left at the end of each HW were very helpful, especially when it came to exam preparation. The course was well-paced. The lectures were fast, but I always had enough time to digest the material. The topics were well-balanced throughout the semester. Although I wish we had more time to discuss diagonalizability and orthogonal matrices... Finally, I enjoyed our in-class discussions. Despite the fast tempo of the course, the Professor would always find the opportunity to engage with students in class. He would ask questions, encourage us to brainstorm possible answers. Such interactions helped me feel involved and present.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

Professor Alvarado was always eager to answer questions, either during class, after class, or during office hours. I could not attend most of his hours because of conflicts in my schedule, but he was always happy to stay after class for 5 or 10 minutes and talk to me about any questions I had. I felt included, and it both stimulated my learning and made me feel comfortable in the classroom. I appreciate that the Professor shared stories about his math struggles with us. He talked about how he would work on a proof of a particular vector space property for the whole evening just to realize afterward that there was a much simpler way to do it. He also wasn't embarrassed about making mistakes. Once, he started the lecture by discussing the question my classmate had asked during the previous class because he had realized he had given an incomplete answer. The Professor's honesty meant a lot to me. First, it made me feel respected. Second, it boosted my confidence in my own abilities. The classes were always fun. Professor Alvarado somehow managed to squeeze jokes into Linear Algebra lectures. And his cat, who appeared on the front page of every midterm, made me feel good about taking exams. Overall, I enjoyed engaging with Professor Alvarado and would eagerly take another class with him.

Additional comments.

Thank you so much for all the effort you put into this course and for making math so enjoyable!

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1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **sometimes**

Complete assignments: **always**

Meet with professor(s) outside of class: **always**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

I would go to office hours at least twice a week. Most of the time; I would go to every office hour he had. That was very helpful as he was always ready to answer any question and guide you through the questions but not solve them for you.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

I am a math major, so this class was always going to be something very interesting to me, but as this is my first non-calculus math class at Amherst besides proofs, I was very interested to see how it would go, and the class really pushed my understanding of proofs in core math.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

The way this class builds on itself was so important to an understanding of this class, and it felt like this was the first math class that I had that the professor really wanted to take time to show how everything we were doing was interconnected and how everything builds on itself.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

This class was a fast-moving one, but it had to be, so lectures were always a bit speedy. What was amazing is that he had all of the notes that he wrote in the lecture online, so if you need a break from writing something down you can always go back and copy it later. Homework was always designed to get us to revisit our notes and make sure we actually took in the information from the lecture.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

He is incredibly engaging in class and outside of class. In lectures, he always waits to see if there are questions and will answer any question, no matter what it is. He always checks in with us when we come into the classroom and is consistently checking in during the lecture. During office hours, he is ready to help and guide you through any issues you have.

Additional comments.

Course Evaluation Form
Fall 2023 – Math 271-01
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1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **often**

Complete assignments: **always**

Meet with professor(s) outside of class: **always**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Going to office hours and Q/fellow hours was really helpful. Spending lots of time on problem sets solidified the skills I was learning in my mind.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

Professor Alvarado was consistently engaging and energetic. Doing proofs was not something I was comfortable with at all, and I was initially worried I wouldn't be able to keep up with the 271 syllabus, but Professor Alvarado's continuous support and enthusiasm ensured I stayed on track.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

I think Linear Algebra taught me to approach Maths in a brand new way. Though initially daunting, it was really interesting having to answer less computational problems, and build these new proof skills. I feel like I'm now able to approach argumentation (not just in Maths but even in my essay-based courses) in a more structured and convincing way.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

For someone who was very unfamiliar with Linear Algebra, I though the pace was rigorous but still doable. I really appreciated having to do the Theorem Definition sheets because that ensured I had reviewed last weeks material before embarking into the next week.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

Professor Alvarado was always open to answering question in class, and for students like me who struggled to voice my questions during lecture, office hours were super accessible and useful.

Additional comments.

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1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **always**

Complete assignments: **always**

Meet with professor(s) outside of class: **always**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Going to office hours to work on the homework

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

Professor Alvarado ALWAYS answered students' questions thoughtfully, thoroughly, and with great enthusiasm. His love for the material and mathematics was contagious.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

This course really helped me develop my proof writing skills: not only in mathematics, but also in building sustained and logical arguments outside of math.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

Professor Alvarado lectures quite fast, but his lectures are always clear, engaging, and easy to follow. While the material itself could be challenging, the presentation of the material makes it easy to appreciate the nuances of and connections between all of the concepts we were learning.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

Professor Alvarado is simply one of the most wonderful human beings I have ever met. He is always more than willing to answer your questions and help you with homework -- it's clear that his main goal is to unconditionally support students in their mathematical journey.

Additional comments.

I'm not a math major, and I sometimes felt outmatched by the math majors in my class, but Professor Alvarado ALWAYS made me feel welcomed and supported. He strikes the perfect balance between challenging you and wanting you to succeed.

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **often**

Complete assignments: **always**

Meet with professor(s) outside of class: **often**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Every class, I came in prepared with a desire to learn from the one and only, Professor Alvarado. I studied class notes, read the textbook, and attempted homework before coming to class which sparked an intensive focus in class. Furthermore, attending Professor Alvarado's office hours enhanced my learning exponentially. He truly cared about me not only as a student but even more as a person which made me want to put my best effort in his class. He is the man!

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

In what ways did he not??? I can't even tell you. He is the best lecturer I've had so far at Amherst. He has so much energy, almost too much, but that's never a bad thing at all. He always made interesting and fun analogies to help us better understand the material for the class. He made me laugh at times with his funny jokes. He would always go beyond the material and make us think outside the box which makes him unique.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

I enhanced my problem-solving skills. The ability to take such complex problems and break them down into simpler, smaller components is something that I have been able to apply in other classes. Furthermore, my ability to write proofs and construct arguments in a logical and concise manner had drastically improved.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

The pace was very good and the assignments lined up perfectly with the material going on in class.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

Professor Alvarado became a new friend of mine this semester. We would talk about things even outside the classroom. He would ask how I was doing and was always there to chat about material and the beauty of mathematics. He was always available. One time, I was returning to our same classroom since I had a class in the same room right after his, and he asked me about how the homework was coming along. I told him I was a bit stuck on the last question on the problem set for that week, and he instantly went to the wall and started working it out with an imaginary pen. Boom, my question was answered in just about five minutes of discussion. He is the man.

Additional comments.

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **often**

Attend class: **always**

Participate in class: **often**

Complete assignments: **always**

Meet with professor(s) outside of class: **always**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

I attended office hours nearly every time they were offered (3 times a week). Professor Alvarado's office hours are extremely helpful. Often, I would not have questions when I showed up. Professor Alvarado created a comfortable environment to work through problem sets and was available when questions popped up. The community he created with our class was very special and made learning a collaborative and engaging process.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

Professor Alvarado did a great job connecting with us as people, which improved our intellectual interests, thinking, and imagination. He is genuinely invested in our success and our futures, and puts in real effort to get to know each and every one of his students. He always brings energy to his lectures and forms great rapport with students. Professor Alvarado's lectures are focused, humorous, and engaging in a way that is easy and fun to follow.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

I am now very comfortable with the topic of linear algebra. I understand vector spaces, bases, matrices, transformations, and other concepts I was unfamiliar with before the course. I also gained significant skills in note-taking, as Professor Alvarado's class moves quickly and requires attention from students. I am also now significantly better at structuring my time and more comfortable going to office hours due to Professor Alvarado. A week-long problem set is something that I expected would give me trouble with procrastination, but Professor Alvarado's availability taught me to space out my work well.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

The structure of Professor Alvarado's course was conducive to learning and was never a source of unneeded stress. The course stuck to a schedule that was easy to follow with regularly assigned problem sets. We were given ample time to complete assignments and study for exams. The course was quickly paced but Professor Alvarado's availability and eagerness to put in extra time ensured that no student fell behind.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

I have had more positive interactions with Professor Alvarado than any other professor in my time at Amherst. He is a caring and kind person who is always honest and full of energy. For a lecture-based class, he still made the classroom feel collaborative and frequently asked for questions and student engagement. Out of class, Professor Alvarado was easy to reach by email, and had very routine and accessible office hours. He is a great person to talk to about math or any other

subject that students need help with. On numerous occasions, I heard Professor Alvarado talking with students about other classes that were causing them stress just to show support and be there for his students. The feedback on my course work was fair and easy to understand.

Additional comments.

Professor Alvarado is my favorite professor at Amherst. I look forward to taking more classes with him in the future!

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **rarely**

Complete assignments: **always**

Meet with professor(s) outside of class: **often**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Meeting with Alvarado during office hours was incredibly effective for improving my learning in this course. He was integral in helping me understand topics I was struggling with, like change of basis and matrix multiplication.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

Alvarado's course structure allowed me to conceptualize linear algebra in a general way; Alvarado allowed me to view math in a more general, broader way--which was the point of the course.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

Proof techniques and the ability to take more general approaches to questions.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

Given the timeframe we had for the class and the amount of material we had to cover, I would say the course was paced well, and the information was presented clearly. The assignments also facilitated a sort of guided study that helped us understand the material better.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

Alvarado was always friendly and available for consultation outside of class. His feedback was always logical, and he understood individual struggles and circumstances.

Additional comments.

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **never**

Attend class: **always**

Participate in class: **often**

Complete assignments: **always**

Meet with professor(s) outside of class: **never**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Doing home works and study for mid terms.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

I personally liked to see the proofs of all theorems or propositions, though they do not usually appear in the exam. The content was also very different from the multivariable class I took last semester. I came to realise math is all about proofs.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

Proof skills

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

The pace was fast but it was well organized. The instructor posts class notes on moodle, so I was able to concentrate on understanding what the instructor says during class, rather than taking notes. The presentation of course material was very clear. Expectations were also clear.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

I did not personally talk to him much (just because I did not have questions to ask) but I see many students asking questions both during and after class. He is very friendly and no one is afraid of asking questions. He also remembers everyone's name and talks to everyone. The classroom environment was highly inclusive and never felt excluded.

Additional comments.

**Course Evaluation Form
Fall 2023 – Math 271-01
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1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **often**

Complete assignments: **always**

Meet with professor(s) outside of class: **often**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Completing all of the homework ahead of time, making sure I pay attention and understand what is in class and that I have notes for everything, go to office hours early in the week to answer my questions early.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

This was my introduction to abstract math and of material that keeps building up on itself through theorems that lead to other theorems and such... and I felt that the story was intriguing and always liked to see what could be next.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

Further development in the mathematical reasoning skills, following chains of logic to prove or disprove certain examples or theorems. I have a greater understanding on how linear spaces behave.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

The pace was good, it was a bit fast but the necessary to cover what was needed in the course and it did not feel overwhelming, plus you get plenty of resources to help you understand. The homework really help you understand the material and the rewriting of all theorem and definitions on the thm def sheet help you know the material by heart.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

The instructor gives a space for question after every theorem, definition, example or any step in a proof to make sure people understand. The learning environment is inclusive and he is very available outside of class.

Additional comments.

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1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **often**

Complete assignments: **always**

Meet with professor(s) outside of class: **often**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Outside of normally attending class, taking notes, doing the homework, and attending office hours, I started using flashcards this semester to memorize the theorems and definitions that we cover in the course. Prof. Alvarado has us write out a theorem/definition sheet each week so we have everything we need in one place, and that sheet helps me with my flashcards since I don't have to rifle through my notes to be able to find the important information (and potentially miss something).

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

Prof. Alvarado stresses that proofs need not be exactly written in one way, only that they are "correct and complete." This mindset has encouraged me to be more creative in my proofs, which has made me focus more on my own logic, rather than if my proof "looks like" his, since they could both be correct and complete. It's made me more independent as a result, and I feel more confident in my abilities as a mathematics student.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

Linear Algebra is my second proofs-based class, so I've been applying the knowledge gained in my first class to really focus in on the precise logic necessary to a proof (i.e., what to include and what not to include). Most of 271 so far has been learning definitions/theorems and directly applying them, but now we're at a point where there are many different ways to put a proof together, and so I've been challenged to think more conceptually about how to reach a conclusion given some information and no direct path to the answer.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

The course was right on pace for where I'm at. We started out slowly, and Prof. Alvarado made sure to clearly explain different ways to structure our arguments, adding thorough justifications in his proofs so we could see how to do it. As we've gotten more proficient in proof-writing, he's gone faster with the material, but it's never felt overwhelming. As a lecturer, he is extraordinarily clear and comprehensible in the concepts he's explaining. He told us at the beginning of the semester that he chooses what to show and assign us with great intention, and he has proven that to be true week after week. He speaks with equally great intention, and he always knows where he is and where he's going with the lecture so that we're never lost or wasting time. Midterms and homework sets are extremely fair, and expectations week-to-week are consistent and fair to the course level.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

Throughout a given lecture, Prof. Alvarado frequently checks in with us to see if we have any questions. If we do, he's willing to stop and clearly explain what the confusion is, and he never makes us feel like it's a waste of time to ask or that it's taking time out of the lecture. He has 4 hours each week of office hours, which has been more than sufficient for me. Feedback on assignments (graded by TAs) is very timely, and the midterms (graded by him) are returned graded to us within half a week.

Additional comments.

Professor Alvarado provides the excellent quality of education that I would expect to receive at an elite institution like Amherst College. The Math Department would be pointedly better with him as a tenured professor.

Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado

1. How often did you:

Prepare for class: **often**

Attend class: **always**

Participate in class: **often**

Complete assignments: **always**

Meet with professor(s) outside of class: **sometimes**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

I think the most helpful part is the theorem definition sheet. While copying my note again, I will go over the proofs and examples again, which really consolidate my understanding of the theorems.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

While I had taken linear algebra in high school, I had remembered nothing beside the fact this is confusing. However, Prof. Alvarado has framed linear algebra in such a straightforward and concrete way, that I feel again interested in learning more about it.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

I think the whole course makes a lot of sense, and each aspect is connected with others to enhance the understanding of linear algebra in general. Prof. Alvarado always tries to present ideas or concepts visually when possible.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

Prof. Alvarado is extremely energetic and supportive. Even if I just mentioned about my other exams and project in passing, he always remembered and constantly checking in with me to see whether I need more time or help.

Additional comments.

Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado

1. How often did you:

Prepare for class: **often**

Attend class: **often**

Participate in class: **never**

Complete assignments: **always**

Meet with professor(s) outside of class: **sometimes**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

I went to office hours occasionally but regularly attended Q hrs and fellow hrs which helped me get through difficult homeworks. I also regularly referred to the class notes graciously provided by Professor Alvarado and updated daily which always helped my understanding of the topics being discussed at the time.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

The take home problem sets always required us to use what we recently learned in class, as well as push us further to critically think to solve given questions. Alvarado regularly displayed visual models in class, such as the effects of transformation, or where the name "echelon" form comes from, which is the formation of troops , which got me to thinking of other areas where such topics could be applied to in the real world.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

I further developed my ability to write proofs and was exposed to new sectors of mathematics I had never known existed. I learned how to compute span and basis and determinants etc when given a matrix. It is hard to write into minimal words the myriad of things I was able to learn from Alvarado.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

The class was more of a chance to be exposed to what we should be studying that week, or what to expect on the homework. After class was when we went back to the notes and really drilled the information into retention. The information was presented very well, although at a rapid pace but that was okay. The discussions were always engaging because Alvarado always brought 110 percent energy to class every day. The homeworks were a lot but manageable.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

You can tell Professor Alvarado cares very much about each and every one of his students individually. He regularly tried to engage with every student personally, asking how they were feeling about the course, exams, homework and always being supportive. I felt very welcomed in the class because of this. He always made sure to give as much time as possible to office hours, too, allowing us to see him outside of class regularly.

Additional comments.

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **always**

Complete assignments: **always**

Meet with professor(s) outside of class: **rarely**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Since everything in this course builds on top of each other, I found it very helpful to consistently review our notes. Furthermore, I found the weekly theorem definition sheets (a weekly assignment graded for completion where we write all the theorems and definitions we learned that week on one sheet) very helpful. It is due before I start working on the week's problem set, so it serves as a refresher for the week that makes the problem set more manageable and useful for reinforcing knowledge.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

I absolutely love the "foreshadowing" Prof. Alvarado does throughout the course. As we are solving certain problems with a very tedious method, Prof. Alvarado would hint at a possible easier method that we will learn later. The foreshadowing was so subtle that I did not notice until we revisited the same problems 2 units later. Prof. Alvarado's jokes also lighten the mood in the classroom and increase engagement and question-asking.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

Beyond a solid introduction to linear algebra, I believe this course has helped me improve significantly regarding my proof-writing abilities. The non-trivial number of proofs that Prof. Alvarado completes in class has helped me visualize what a research-level-rigorous proof looks like, and the proof-writing questions on the homework have helped me turn that visualization into a skill.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

I believe the overall design of the course impacted my learning very positively. Each section within each unit follows from previous materials very naturally and is motivated by examples or questions. The material did not feel like something we had to memorize but rather an exploration of a part of the field.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

The interactions are very positive. As I mentioned already, Prof. Alvarado's jokes and positive attitude increase engagement and encourage students to ask questions. The feedback I received on my exams have helped improve my proof writing.

Additional comments.

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **rarely**

Attend class: **always**

Participate in class: **rarely**

Complete assignments: **always**

Meet with professor(s) outside of class: **sometimes**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Going over Prof. Alvarado's notes, looking at the examples we did in class, and practicing with problem assignments.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

He made the concepts very clear. We built the foundations studying basis and transformations to eventually understand matrices and determinants.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

Showing proofs clearly.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

The pace was very well; not so fast, and not so slow. Prof Alvarado uploaded the materials and notes on the moodle, so it was always accessible. Assignments tested our knowledge and touched almost all the concepts.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

He was very helpful in after-class discussions. Also, in class, we did some example problems together, which was very helpful as he went over each step clearly. Due to my time conflicts, I could not attend the office hours, but whenever I asked him to schedule a meeting, he was always accessible. He was also very understanding and friendly. Once I asked him for a homework extension when I had to make an emergency travel, and he easily offered me extension for my homework deadline, and when I returned, he checked with me if I have been following up with class notes and if the concepts taught during those times were unclear to me.

Additional comments.

Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado

1. How often did you:

Prepare for class: **sometimes**

Attend class: **always**

Participate in class: **rarely**

Complete assignments: **always**

Meet with professor(s) outside of class: **always**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

utilizing qfellow hours to work through proofs, looking at professor's proofs to understand the logic of techniques

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

engaging lectures, making a dense and abstract introduction to a topic easier to digest

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

proof writing techniques, algorithmic thinking, abstract thinking

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

everything was transparent and I knew everything I need to be successful. adapted well to circumstances and made sure we knew everything important (nothing that felt irrelevant)

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

positive and supportive atmosphere in office hours. never a dull moment

Additional comments.

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **often**

Complete assignments: **always**

Meet with professor(s) outside of class: **always**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

I think focusing on understanding the material rather than memorizing was very helpful. I also always read the textbook, did all my assignments, and went to every office hour with Professor Alvarado, and sometimes if needed with the Fellows and Q-Center Fellow.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

Professor Alvarado made the class extremely engaging. The way he lectures is so energetic and entertaining that one feels engaged in the material the entire time. His homework assignments can feel a little challenging sometimes, which I believe pushed me to work harder and expand my ways of thinking. I also think thanks to his class I have become very meticulous in my proofwriting and thinking, which allows me to also think on a deeper level in my other classes. On the intellectual interest aspect, his class helped me realize I would like to take more math classes.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

I think my critical thinking skills and argumentative skills (in regard to mathematics) were probably my most developed skills. Professor Alvarado's assignments and problems helped me push my thinking skills and look at the same problem from multiple aspects.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

I think this course has been one of the most impactful and beneficial to my learning. I liked the design and pace, as it was fast but everything tied together at some point. Professor Alvarado does an amazing job at presenting the expectations and answering questions. He is extremely clear on what we need to work on, what he is expecting, and where we should be at any given point. As mentioned before, his assignments are varied and allow you to see different outcomes of a certain property, or even prove essential things that you will use later, which helps me understand the why of much of the course material.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

I have had great conversations with Professor Alvarado. He is always very engaged with students' questions and ideas, and will always go a little out of his way to answer a question or clarify something. An amazing detail that I appreciate about him, is that if somebody asks a question related to future material, he makes it clear that we will get there, and once we do, he always brings up the question and the individual who asked it and then answers the question at that point. I think that makes people feel heard and included. He is always encouraging people to ask questions or ask us to state our prediction or thoughts on something as a class, before he reveals and answer or theorem. In regards to availability, he accommodated his office hours to

accommodate most people. I always received very clear feedback, and guidance too. When I got stuck, instead of telling me what to do, he would guide me with engaging questions that most times led to me being able to understand the problem and figure it out.

Additional comments.

I think this was an amazing course, and I am really glad I got to take it with Professor Alvarado. He's an extremely engaging and clear person, who cares about students and our learning and wants us to deeply engage and understand the material.

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **often**

Attend class: **always**

Participate in class: **sometimes**

Complete assignments: **always**

Meet with professor(s) outside of class: **often**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Going to office hours and Math Fellow hours were very helpful, not only in trying to complete the homework, but also learning the material in class and how to approach linear algebra proofs generally.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

I like that Professor Alvarado, when possible, would provide visual examples of what we were talking about. When I see something clearly, I tend to remember, and understand it a lot better. I also like the way that he organizes his class notes, and that he shares them with us. I think they make a lot of sense, and make it easier for me to follow the material after class since we have to go through it in class quickly since there is so much of it.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

I learned more about how to think about things abstractly and applying abstract concepts to specific situations in the context of linear algebra which will benefit me in my career in the future.

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

The course was fast paced, but it seems like it must be. There is a lot of material to cover in linear algebra. However, Professor Alvarado explained concepts very clearly in class, and was always very helpful in office hours when I did not understand something. I think the homework he assigned were very good at training me to solve linear algebra problems and apply that skill on his tests. Ultimately, I think I have a more solid understanding of linear algebra and feel prepared to continue to a more advanced math class if I would like to.

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

I think Professor Alvarado provided a very inclusive learning environment. He gave us multiple opportunities to ask questions during class, and even more in office hours. I appreciate the amount of office hours he offered. My professors in my other classes often offer a lot fewer office hours (2 hours at most and sometimes all in one block of time), but Professor Alvarado offered a total of 4 hours and they were staggered throughout the week, which was really nice. I felt like he was very helpful in office hours, and would put in as much time as necessary for me to understand a topic which I really appreciated. I also appreciated his different ways of allowing us to get participation in class (talking in class, going to math talks, etc) which was nice since I am someone who does not always feel comfortable speaking up in class.

Additional comments.

I really enjoyed the course, and I appreciate that I had Professor Alvarado to teach it!

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **often**

Attend class: **always**

Participate in class: **sometimes**

Complete assignments: **always**

Meet with professor(s) outside of class: **sometimes**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

I liked the way how he had us solve problems from the book, and additionally gave us questions from outside the book. This way, it helped me learn things from the book outside of the class notes too. And I really like his 'theorem-definition' sheet scheme; this helped me catch up with the class every week.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

His problem sets were challenging and fun, so I just felt more engaged.

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

Problem solving, proof-writing skills

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

Professor Alvarado is the best at what he does. He really engages the students in the class. He is very humorous in his lectures when he engages with the students questions. Remembering his humor honestly helped me remember a lot of stuff during my test day.

Additional comments.

Professor Alvarado loves teaching, and he's really great at it. There is lots of respect for his passion. Also, he is indeed one of the most approachable, kindest, and understanding professors I've had so far at Amherst. I would definitely take classes with him again if I get a chance.

**Course Evaluation Form
Fall 2023 – Math 271-01
Professor Ryan Alvarado**

1. How often did you:

Prepare for class: **always**

Attend class: **always**

Participate in class: **rarely**

Complete assignments: **always**

Meet with professor(s) outside of class: **often**

2. Using specific examples, please briefly describe what you did that you feel was particularly effective for improving your learning in this course?

Attending as many office hour sessions as possible, going to peer tutor and math fellow hours was also helpful.

3. In what ways did this course and instructor stimulate or shape your intellectual interests, thinking, and/or imagination?

though his enthusiasm for teaching this professor made learning the material much more enjoyable, and he was very good about helping people think through proofs and think about how to use what he had taught to solve difficult problems and develop complex proofs

4. Please describe the most significant skills and/or knowledge that you gained or further developed during this course.

the class and instructor helped me understand the mathematical background, reasoning and skills behind some of the processes I use in computer science algorithms, specifically those involving linear algebra

5. Considering the overall design of the course, how did the pace, presentation of information, clarity of expectations, assignments, activities, and/or discussions in the course impact your learning?

I felt the instructor did a very good job with pacing given the severe constraints placed on the class by the need to cover such a large amount of material. He was able to adjust his pace during classes, increasing or decreasing pace depending on student understanding, and still somehow remained on schedule

6. Please describe the nature of your interactions with the instructor in this course, including the instructor's engagement with student questions and ideas in class, their cultivation of an inclusive learning environment, their availability outside class, and the feedback you received on your course work.

my interactions with the instructor were always very positive. He made himself very available to students, scheduled a generous number of office hours every week, and was always ready to help anyone who was struggling or needed another explanation of material we had covered. He pushed us to do better, and was always supportive in getting us get there.

Additional comments.

100% recommend, made a challenging class i was worried about much more manageable, I learned a lot and would definitely take a class with him again