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1 Introduction

I am currently a Pacific Institute for the Mathematical Sciences (PIMS) postdoctoral fellow in the Department of Mathematics and Statistics at the University of Calgary. I have been teaching university level courses as the instructor of record since I began graduate school in 2017, but I have been an educator in other capacities for much longer.

My first formal role as an educator was at the Boonshoft Museum of Discovery: a children’s science museum in Dayton, Ohio. I was a summer camp instructor there, and I developed and taught summer camps on math, computer science, and general science for their summer programming. It was at the Boonshoft where I developed my passion for education; the campers were so enthusiastic about learning that I couldn’t help but want to keep teaching.

I have since continued educating students as a peer tutor during my undergraduate education at Case Western Reserve University (CWRU), as a TA and instructor of record during graduate school at the University of Oregon (UO), and as an instructor during my current postdoctoral fellowship at the University of Calgary (UC). I have taught courses as instructor of record at all levels of undergraduate mathematics, from university mathematics (designed for students who need math credit, but do not need to take courses in the pre-calculus sequence), to pre-calculus, to variations of calculus, to linear algebra, and elementary number theory. These courses have been in several modalities, from fully face-to-face, to fully remote, to a hybrid of face-to-face and remote.

In addition to teaching college courses, I have mentored several students (both undergraduate and graduate), and I regularly volunteer as a math educator in the community. I have mentored reading projects on advanced topics with undergraduates at UO, and I led a graduate student reading project through the PIMS First-Year Interest Group program. I spent a year mentoring a master’s student’s thesis at UC. I have volunteered as a math educator in a number of community events with the graduate student chapter of the Association for Women in Mathematics (AWM) at UO, and I currently volunteer at UC’s Math Nites: a community event for local grade school students.

My teaching influences are primarily the teachers whose classes were most effective for me. Ken Barrett’s classes taught me about the importance of teaching students why math is the way it is. Mark Meckes’ classes taught me about the importance of assigning frequent, small assignments, and giving timely feedback. Ellen Eischen’s classes taught me about the value of devoting even a small portion of the class to active learning activities.

I am also heavily influenced by the University of Oregon mathematics department’s Student Teaching Seminar¹, which I co-founded and co-organized with Marissa Masden in 2019. In this seminar, a group of graduate students met weekly to discuss a pertinent topic to math education; sometimes we would discuss big picture topics like mastery grading, and other times, we would give technical tutorials like how to effectively create quizzes on UO’s learning management system.

¹The seminars at UO had the prefix “Student” if they were primarily for graduate students. Here, the “Student Teaching Seminar” means “the teaching seminar run by and designed for graduate students” as opposed to the “Teaching Seminar,” which was “the teaching seminar run by and designed for faculty.” The Student Teaching Seminar has nothing to do with the activity of “student teaching” which is commonly undertaken by undergraduate students who are obtaining education degrees.

In the remainder of this document, you can find a list of my teaching responsibilities, my teaching philosophy, my professional development activities, my awards and honors, some sample course materials, student and peer feedback, and my thoughts on how I want to continue to develop my teaching.

2 Teaching Responsibilities

2.1 University of Calgary

Position title: PIMS Postdoctoral Fellow

Time at organization: August 2023–Present

Courses for which I have been an instructor of record:

Course Title	Terms Taught
Linear Methods I	F23, W24, F24

Mentoring opportunities:

- PIMS First Year Interest Group: I led a reading group on Diophantine Approximation with three graduate students at the University of British Columbia. We read selections from Schmidt's book, Diophantine Approximation, and from Bilu and Bugeaud's paper *Démonstration du théorème de Baker-Feldman via les formes linéaires en deux logarithmes*.
- I mentored a master's student's research project for a little over a year. I was asked to help bridge the gap between the student's background in computer science and the advisor's background in pure mathematics.

Other teaching opportunities:

- I have been volunteering at the UC Math Nites, an event which runs every other week during UC's fall and winter terms. The event is intended to engage local grade school students in mathematical puzzles and problems that they might not typically see in their curriculum. I occasionally bring a mathematical game to the meetings and I ask students to both play and analyze that game.

2.2 University of Oregon

Position title: Graduate Employee

Time at organization: August 2017–June 2023

Courses for which I have been instructor of record:

Course Title	Terms Taught
University Mathematics I	Su18, Su19
College Algebra	F17
Elementary Functions	Sp18
Calculus for Business and Social Sciences II	F18
Differential Calculus	W20, F20
Integral Calculus	Sp20, W21, F21
Sequences and Series	Sp21
Fundamentals of Number Theory	W22, Sp22

Courses for which I have been a teaching assistant:

Course Title	Terms as TA
College Algebra	Sp19
Calculus for Business and Social Sciences I	W18, F19, Sp23, W23
Calculus for Business and Social Sciences II	W19

Mentoring opportunities:

- Directed Reading Program 2023: I mentored an undergraduate reading project on continued fractions and Khinchin's Theorem. At the end of the project, the student gave a presentation on his findings to his peers.
- Directed Reading Program 2020 and 2021: I mentored an undergraduate reading project in formal logic; one year, we covered Gödel's Incompleteness Theorem, and the next year, we covered subsystems of Peano Arithmetic. At the end of the 2021 project, the student gave a presentation to his peers (the 2020 presentations were canceled due to the COVID-19 pandemic). This student is now a graduate student in mathematics at Montana State University.

Other teaching opportunities:

- “Preschool” Instructor: I co-ran a two week long problem solving session with incoming first-year PhD students to help them decide which classes to take during their first year.
- AWM K–12 Outreach Committee: I designed and presented educational programs for K–12 students in museum and festival settings. I ran activities at three Eugene Math Festivals, two Girls’ Science Adventure Days, and one STEM festival at a local elementary school.

2.3 Case Western Reserve University

Position title: Peer tutor

Time at organization: January 2015–May 2017

Courses for which I was a peer tutor:

- Calculus I, II, III

- Differential Equations
- Linear Algebra
- Abstract Algebra
- Intro to Logic
- Math Logic and Model Theory

2.4 Boonshoft Museum of Discovery

Position title: Summer Educator

Time at organization: Summer 2012–2017

Summer camps I created and taught:

- Project Mindbender: A math/logic/computer science camp focusing on teaching basic reasoning skills through game playing, scavenger hunts, and magic tricks
- eMagination: A computer science camp in which students learned to create their own Minecraft modifications
- Minecamp: A Minecraft-themed camp in which students learned the basics of materials science, computer programming, fencing, and cryptography

3 Teaching Philosophy

Introduction

Learning mathematics is rewarding, while also being difficult and intimidating. As someone who has spent much of his life learning mathematics, I should know! Now, as a mathematics instructor, my goal is to keep mathematics rewarding, while helping students appreciate the difficulty, and removing the intimidation. I work towards these goals by using effective teaching techniques and by building a supportive mathematical community.

Teaching Effectively

My courses typically have three major components: lecture, active learning, and assessment. The shape of these components varies from course to course, but I will explain my guiding principles and I will give some examples and feedback for each component.

Lecture

I use backwards design principles [11, p. 50] to create my lectures: I first determine the major goal of that day’s lecture, and then I reverse engineer the necessary components. For example, when teaching continuity in differential calculus, I determined that the essential reason we care about continuity is to establish the Intermediate Value Theorem. From there,

I was able to start the lesson on continuity with an activity that asked students to compare and contrast statements like “last year, I was five feet tall and this year, I am seven feet tall, so I must have been six feet tall at some point in between” and “last year, I had five dollars, and this year, I have seven dollars, so I must have had six dollars at some point in between.” This activity allowed me to introduce continuity as something natural rather than artificial.

When giving lectures, I mirror the attitude that I want my students to have when learning math. I present content enthusiastically and authentically, making sure to comment on things that are surprising, strange, and inspiring. I excitedly take student questions, and after answering, I ask students if I answered their question (and I specify that it’s okay to say no), rather than asking the loaded question “does that make sense?” My demeanor during lecture is something that my students frequently cite in their course evaluations, with one student in my winter 2024 course saying that I had a “wonderful bright, sunny attitude,” while another student commented “Greg was great at answering student questions, and wouldn’t move on until the question was answered in a way we understood.”

Active Learning

In their metastudy [7], Freeman et al. find that active learning makes a substantial impact on student performance. As a consequence, I ensure that each day’s class includes active learning in addition to lecture, no matter how large or small the class is.

When teaching an online 21-student calculus course at the University of Oregon (spring 2021), I regularly asked students to complete exercises in breakout rooms. These problems were intended to help students resolve the cognitive dissonance [2] that frequently appears when learning sequences and series—for example, the sense of confusion that you feel when you haven’t yet internalized the difference between a sequence and its corresponding sequence of partial sums². In the end-of-course survey, five of the six respondents indicated that active learning was beneficial, while the remaining student said it was neutral.

When teaching an in-person 119-student linear algebra course at the University of Calgary (winter 2024), I punctuated lecture with true/false questions in think-pair-share format. The conceptual nature of these questions helped students construct knowledge for themselves [8] rather than merely passively absorbing it from lecture. The end-of-course survey at the University of Calgary did not ask students about their opinions on the active learning, but when my supervisor (Jerrod Smith) observed my current course—which features nearly identical exercises—he complimented my ability to use these activities to “prompt further discussions and lead students to a correct solution in a collaborative way.”

Assessment

In my courses, I use both summative and formative assessments³ [5].

²For an end-of-term worksheet featuring these principles, see section 6.2.

³One complicating factor for this description of my assessment style is the fact that my recent teaching (2023 through 2024) has been for highly coordinated courses, in the sense that the course coordinator determines the grading scheme, while one of the instructors creates the assessments for the entire course. As a result, this subsection typically refers to courses that I taught prior to 2023, where I had control over assessment methods.

My summative assessments usually consist of traditional exams and a final project. On the exams, I ask questions at all levels of Bloom's Taxonomy [3] in order to not only assess their content knowledge, but also their depth of understanding⁴. For the coordinated course I am currently teaching (linear algebra at the University of Calgary), I was asked to be the instructor in charge of writing the exams because I had given thoughtful feedback on exams in previous terms. In addition to exams, I ask students to complete final course projects in order to learn mathematical communication skills. When assigning projects, I ask students to submit regular updates throughout the term so that I can provide them with feedback throughout their process [11, p. 76–77].

My formative assessments consist of frequent small assignments which establish a feedback cycle [1, p. 49]. I give regular quizzes, which I mostly grade on effort, and this gives the students low-stakes chances to practice for exams [11, p.79]. Additionally, I try to give short homework assignments due twice a week so that students can get feedback close to the time they completed the assignment.

That said, traditional assessment methods are coming under close scrutiny. Articles and books like [4, 6, 13] indicate that our current grading techniques are insufficient for promoting learning. In the future, I would like to explore mastery grading to address these issues.

Building Mathematical Community

Inclusive Teaching

Mathematics can be isolating for students, especially those who do not see many people like them in the mathematical community. Well-planned lectures, engaging activities, and clear assessment mean relatively little to a student who does not feel comfortable in a math classroom. One of my goals is to explicitly welcome those students into mathematics.

I use research-informed and common-sense techniques to include students from diverse backgrounds. I learn and use students' preferred names [9, 12], I make explicit inclusivity statements on the first day of class to set the right tone [10, 12], and I share my pronouns with my class [12]. I incorporate universal design principles into my classroom structure, like building in deadline flexibility for all students [10]. I explicitly reach out to students with learning accommodations to figure out how I can best help them with their individual needs. I grade anonymously (when possible) in order to mitigate the impact of my own implicit biases. I ask students for anonymous feedback during the term, and I share the results with them and implement their ideas. Finally, I explicitly encourage student questions, and I respond joyfully to those questions in class.

Mentorship

Outside of the classroom, I frequently volunteer to mentor students in order to help them wherever they are in their mathematical journey. My philosophy regarding research and reading projects is that those projects are for the students, not for me. This philosophy stems from my own positive experiences as a mentee: my Ph.D. advisor suggested a project, but was incredibly supportive when I found something different that I was curious about.

⁴For a sample exam which does this, see section 6.4

Rather than shoehorning me into her research program, she encouraged me to make my project into my dissertation, which I did! As a result, I mentor others in a similar style: I get to know my students' interests, and I try to tailor the project to their needs.

In undergraduate reading projects that I led through the University of Oregon's Directed Reading Program, my students and I would devote meeting time to discuss writing style, presentation techniques, or whatever auxiliary skills my mentees were working on at the time. We would then adjust the reading schedule to accommodate for those discussions so that students had adequate time to develop those skills with feedback and supervision.

While I have not yet formally supervised a research project, I have spent a year informally mentoring a University of Calgary master's student's thesis. Our meetings concern whatever she happens to be working on at the time; we most frequently talk about the content of her thesis, but we've had several discussions about productive research habits, and writing and teaching mathematics.

Conclusion

Ultimately, my teaching principles and practices are informed by my care for my students' growth. This means that I am willing to adapt to a changing education landscape and my students' changing needs. Students want and need mathematics for a wonderful variety of reasons, and I want to help them acquire the skills they need to make the world a better place.

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4 Professional Development Activities

Since I began teaching courses as a graduate student, I have been undertaking voluntary activities so that I can become a more effective teacher.

My first foray into pedagogy began as a volunteer to be a subject for a study based out of Oregon State University. The researchers were studying how to effectively provide support for graduate student instructors, and I signed up as a way to reflect on my own teaching practices. After participating in the survey for a few years, I began to understand how valuable it was to regularly engage in conversations about teaching with my peers. As a consequence, I co-founded and co-organized the Student Teaching Seminar in the University of Oregon's math department in 2019.

I continued to co-organize this seminar until I graduated after the spring term in 2023. During those four years, the seminar met weekly to discuss pertinent topics in math education. For some meetings, we discussed articles or book chapters that we read, and in other meetings, we would give practical tutorials on how we implemented certain practices. Notable pedagogical topics we discussed include: Bloom's Taxonomy; APOS theory; diversity, equity and inclusion in the math classroom; mastery grading; metacognition; growth and fixed mindsets; and (the myth of) learning styles. Notable implementation topics we discussed include: how to write your own WeBWorK problems; how to write good quizzes in Canvas; how to write a good syllabus; how to teach during the COVID-19 pandemic; and how to return to the classroom after the COVID-19 pandemic. We kept notes for many of our meetings, and I still periodically reference these notes.

After graduating from the University of Oregon, I came to the University of Calgary. While I am officially a research postdoc here, I still have teaching responsibilities and I

have continued to work on my teaching practices. Since joining UC, I have taken four badge courses from the Taylor Institute for Teaching and Learning, and I have completed the requirements for the Postdoctoral Certificate in University Teaching and Learning. The courses I have earned badges in include: Equity, Diversity, and Inclusion; Developing Your Teaching Dossier; Scholarship of Teaching and Learning Foundations; and Theories and Practices. These badges can be found in the Appendix. Additionally, I participated in the math department's summer 2024 book club on ungrading.

This last reading, combined with the UO Student Teaching Seminar's discussions on mastery grading, have helped me develop my interest in alternate assessment methods. I'm not convinced that fully ungrading mathematics courses is appropriate, but I do believe that the standard partial-credit-based grading system provides a misleading level of granularity and incentivizes the wrong student behaviors. I would love to try new approaches to grading in order to more effectively help students learn.

5 Awards and Recognition

I have been nominated for two teaching awards, one of which I won. Unfortunately, I have no information about these awards (e.g. quotes from nominees) other than what is presented here.

- University of Calgary Students Union Teaching Excellence Award nominee (2024)—I was nominated for this award by my students in my Linear Methods I course in the winter of 2024.
- University of Oregon Anderson Graduate Teaching Award (2022)—this award is given to two mathematics graduate students completing their fifth year of graduate studies for excellent teaching practices.

6 Teaching Materials

6.1 Sample Syllabus

Below is the syllabus for my Fundamentals of Number Theory II course that I taught in the spring term of 2022. I always try to provide a course syllabus that can function as a complete course guide which can answer any student question about the course (or at least point them to where they can get their questions answered). The syllabus covers policies about the classroom environment, the who/what/when/where on course meetings and office hours, a course schedule, learning outcomes, the grading scheme, weekly assignment schedule, generic assignment rubrics, list of my expectations for my students, list of things my students can expect from me, and tips for success in the course.

Instructor: Greg Knapp (he/him)
Office: Fenton 312
Email: gknapp4@uoregon.edu

Office Hours:
Mo/We: 11:00 am–12:00 pm
Thu: 9:00–9:50 am
Fri: 2:00–3:10pm

1 Classroom Environment

1.1 Inclusivity

Historically, mathematics has been an exclusive discipline and has shut out people for their race, gender, sexual orientation, political views, etc. While terrible, this cannot be undone. However, we can work to create a more inclusive environment for current mathematics students. Racism, sexism, ableism, other discrimination or harrassment, or general behavior that creates an unwelcoming environment will not be tolerated in this classroom. Furthermore, even if you do not see people like you represented in the mathematical community, you still belong here. Know that I will support each of you in your mathematical journey because math is for *everyone*.

What can you do if someone is creating an unwelcoming environment in this classroom?

1. Talk to me. I will do my best to work with the individual who is creating an issue and resolve it. If I can't do this, I will talk to someone at the university who can resolve this. If I'm creating the problem, I will listen to you and do my best to correct my behavior.
2. If you don't feel comfortable talking to me, my supervisor is Mike Price (mprice@uoregon.edu).
3. Talk to a university official. You can find more information about your options at <https://respect.uoregon.edu>, <https://safe.uoregon.edu>, and <https://investigations.uoregon.edu>. You can also contact the non-confidential Title IX office/Office of Civil Rights Compliance (541-346-3123) or Dean of Students offices (541-346-3216) or call the 24-7 hotline 541-346-SAFE for help.

1.2 My Reporting Obligations

I am a student-directed employee. In short, this means that I listen to your request when deciding whether or not to report something that you disclose to me to the university. For detailed information about my reporting obligations as an employee, please see my Employee Reporting Obligations at <http://titleix.uoregon.edu/employee-reporting-obligations>. I am also a mandatory reporter of child abuse. You can find more information about the Mandatory Reporting of Child Abuse and Neglect at <http://hr.uoregon.edu/policies-leaves/general-information/mandatory-reporting-child-abuse-and-neglect>

1.3 Mental Health and Well Being

College can be overwhelming in a number of ways. If you are struggling with your mental health and need some deadline flexibility, talk to me. You can also find support through the Duck Nest (<https://health.uoregon.edu/ducknest>) and through University Counseling Services (<https://counseling.uoregon.edu> or 541-346-3227). I've been to UCS and I had a really positive experience with them.

1.4 Academic Integrity

You are free to work with others when studying or doing homework. Unless explicitly instructed otherwise, however, you must submit your own work. For a full description of academic misconduct, see the Student Conduct Code at <https://policies.uoregon.edu/vol-3-administration-student-affairs/ch-1-conduct/student-conduct-code>. Academic misconduct will be reported to the university and it will result in a zero on the assignment on which academic misconduct occurred. Multiple or egregious instances of cheating will result in an 'F' in the course. *This policy is non-negotiable and I am not willing to discuss alternate consequences.*

You are now at the point in your career where it is critical to acknowledge your collaborators and sources. You are encouraged to work with others, you are allowed to look up homework problems online, and you are *required* to acknowledge your collaborators and sources. For each problem you submit: if you work with another student or if you find a fact online or in another book, you must write something like "This problem completed in collaboration with [student here]" or "By theorem 1.5 of Milne's *Algebraic Number Theory*,..." or "This solution based off the Stack Exchange post here:..."

1.5 Accessibility

For those of you who are currently registered with Accessible Education Center for any kind of accommodations, please communicate with me about this during the first week of the term so that we can design a plan for you. If you need learning accommodations but are not registered with the AEC, talk to them *as soon as possible*. It is much more likely that measures can be taken to provide adequate accommodation if the organization is done through AEC. I have attempted to provide documents that are accessible. Please let me know if you need additional accommodations. You can find the AEC at <https://aec.uoregon.edu/>.

2 Class Meetings

10:00–10:50 AM in University 301 every Monday, Wednesday, and Friday. You can also attend lecture over Zoom or find the recordings on the course Canvas page. The Zoom meeting ID for class is 922 2305 6596.

3 Office Hours

Office hours are your chance to ask me questions! I will be in my office (Fenton 312) or in the atrium on the top floor of Fenton at the times listed at the top of the syllabus and if you show up, I'll do my best to answer your questions and help you learn some math. You don't need to make an appointment to attend office hours. If you can't attend any of my office hours and my schedule permits, I'm also happy to meet with you individually. Just send me an email asking to meet with me and I'll let you know if/when I'm available!

If necessary, some office hours may be moved to Zoom during the term. In that case, I will send out a Canvas announcement with the appropriate details.

Since a member of my household is immune-compromised, I kindly ask that you wear a mask whenever spending a prolonged period of time with me indoors.

4 Materials

4.1 Textbook

We will use *Elementary Number Theory & its Applications*, sixth edition, by Kenneth Rosen. You can find this textbook in the usual places you would expect to find textbooks. Email me if you have trouble finding it.

4.2 A “Scanner”

You will be peer-reviewing each other's homework, typically by handwriting your comments and then scanning and uploading to Canvas. You can use a phone app (the Microsoft OneDrive app will do this for free and we have unlimited storage through UO) or an actual scanner (which the library probably has). If you have a way of annotating .pdf files on a tablet, however, you are also welcome to use that option.

4.3 A Computer

You will be required to type your homework using the typesetting program L^AT_EX (more on this later). Typing in this program will require access to a computer with a physical keyboard.

5 Tentative Schedule

Here is my goal for the material we will cover each week along with the corresponding assignments due that week (see assignment details later in the syllabus):

Week	Section(s)	Assignments Due
1	6.3	HW 1 draft
2	7.1–7.2	HW 1 peer review, final copy; HW 2 draft
3	7.5	HW 2 peer review, final copy; HW 3 draft
4	7.5	HW 3 peer review, final copy; HW 4 draft
5	9.1	HW 4 peer review, final copy
6	9.2–9.3	Portfolio ; HW 5 draft
7	9.3–9.4	HW 5 peer review, final copy; HW 6 draft
8	9.4, 13.1	HW 6 peer review, final copy; HW 7 draft
9	13.1, 13.3	HW 7 peer review, final copy; HW 8 draft
10	Presentations	HW 8 peer review, final copy

6 Learning Outcomes

By the end of the course, a successful student should be able to:

- Write clear, concise proofs using the techniques of
 - mathematical induction
 - contradiction
 - cases
 - disproof by counterexample

when relevant

- Provide constructive and thoughtful feedback to other students
- Exhibit understanding of how to use basic algorithms to do certain computations with integers, like computing values of multiplicative functions, primitive roots, and discrete logarithms.
- Precisely state important theorems like Euler's Theorem, the Euler Parity Theorem, Euler's Partition Formula, the classification of Pythagorean Triples, and the Four Square Theorem
- Use important theorems to give proofs about multiplicative functions, partitions, primitive roots, and sums of squares.
- Write clear, long-form exposition explaining a topic in number theory to other students
- Clearly present new mathematical information to your peers

7 Grading

Grading will be determined according to the following scheme:

Participation	5%
Written Homework	30%
Written Feedback	15%
Midterm Portfolio	15%
Final Paper	20%
Final Presentation	15%

I will make a strong effort to make the standard grading system applicable to this course (e.g. grades in the 80% to 89% range will be Bs, those in the 70% to 79% range are Cs, etc., with plus and minus grades being awarded to the upper and lower 2% of a bracket). If grades are too low, I will curve them up. If grades are too high, I will *not* curve down.

7.1 Participation

The purpose of the participation credit is to encourage you to engage in mathematical conversation each week. Mathematical conversation will expose you to new ideas and perspectives, help you learn to critique your own thinking, teach you to constructively push back on others' ideas, and help you learn the course content in more depth.

Participation will occur in the form of weekly question-asking and question-answering. Each week, you will have two different options for how you can earn this credit.

1. Attend class and participate in a *group* on worksheet days.
2. Ask or answer a math question. This can occur in office hours or on the weekly Canvas discussion. If you ask a particularly good question or provide a particularly insightful answer, you may receive extra credit.

7.2 Written Homework and Feedback

Most weeks, you will have to complete some or all of the following three tasks:

1. Draft solutions to a new homework assignment.
2. Peer-review another student's homework assignment.
3. Finalize your solutions to the previous week's homework.

Here is the schedule for *weeks 1 and 2* (and you can infer the general schedule for most other weeks from this sample):

Week 1

Monday	Homework 1 posted
Thursday	Draft of homework 1 due
Friday	Peer review for homework 1 assigned

Week 3

Monday	Homework 2 posted
Tuesday	Peer review of homework 1 due
Thursday	Draft of homework 2 due
Friday	Final copy of homework 1 due
Friday	Peer review for homework 2 assigned

Note: Canvas will tell you that the draft assignments are due on Thursdays at 11:59 pm and the final copies of the assignments are due on Fridays at 11:59 pm. However, since there's no chance I'll be assigning the peer review assignment or grading your homework at midnight, there's no reason you can't turn it in up until the next morning. The assignment will remain available and you can submit your homework without penalty until 10:00 am on the day after the stated due date.

7.2.1 Format

In this class, all of your homework must be submitted as a .pdf file which you create using the typesetting program L^AT_EX. This is industry-standard for all mathematical documents (and publishing in other fields as well). More instructions for how to create documents using L^AT_EX can be found on Canvas (and we will spend some time in class on this).

Important: Please do NOT put your name on any of your submissions. This will reduce the role that implicit biases play when peers are commenting on your work and when I am grading your work.

7.2.2 Peer Review

Before submitting a final copy for me to grade, you will submit a draft for a peer to review and then you will be assigned a peer's homework to review.

The purpose of this assignment is to encourage you to examine your own thinking by putting you in the perspective of the audience rather than the writer. Often, when writing, my own perspective and thoughts are crystal clear to me—because those are my thoughts!—but it can be hard to tell when I've been sufficiently clear in my writing so that another person can understand my thinking. By reviewing your peers' assignments, you will learn how to make sure you are conveying enough information so that people other than you can read your work. Additionally, you may learn other ways of doing the problems or other formatting or typesetting tricks and techniques.

Important: Your peers are relying on your feedback. If you are unable to review a peer's assignment in any given week—whether for an “excusable” reason or not—please let me know so that I can remove you from that week's rotation. As of now, I'm not sure how this will work with Canvas, so also keep an eye on your email throughout the term in case I need to email you individual instructions.

Logistically, when you are assigned a peer's homework to review, you will either...

1. Print your peer's assignment, hand write your comments in the margins, then scan the annotated copy and upload it to Canvas.
2. Download your peer's assignment, hand write your comments on a tablet (using a program like Drawboard PDF, e.g.), then upload the annotated copy to Canvas.

When you are peer reviewing, you will want to make sure that your comments...

1. Are thorough: Comment on every relevant aspect of their homework.
2. Are constructive: When giving criticism, focus on what your peer can do better rather than what they did poorly. When giving positive feedback, give *encouragement* rather than *praise*. Encouragement focuses on the deed where praise focuses on the doer. (Consider the difference between the comments "Wow, you study math? You must have worked really hard" and "Wow, you study math? You must be really smart.") It's better to focus on the choices they made (which they can change in the future) rather than their state of being (which can't be changed).
3. Focus on the logic: Do your peer's claims follow from their previous claims and the assumptions of the problem statements? Are their proofs complete?
 - Important: while you can give your peers hints how to do the problem, do *not* tell them how to do the problem.
 - Important: make sure that you are giving *correct* feedback to your peers. If you are not sure that something you are saying is correct, do not say it.
4. Focus on the writing: Does your peer state when they are using named theorems? Do they state when they are doing a proof by contradiction? Are there shorter or clearer ways of saying the same thing? Did it take you a long time to read and understand a particular sentence?
5. Focus on the format/organization: Is their L^AT_EX easy to read? Could their notation be improved? Could they rearrange the parts of their proof to improve the clarity?

The latter three categories are the components which I will be using to grade your completed homework. You are welcome to use my rubric (see below) to assist your reviewing.

7.2.3 Grading Rubric

Your peer review assignments will be graded for thoroughness, accuracy, and constructivity. It is critically important that you catch the author's serious errors and that you give correct feedback to them.

Your final homework assignments should have the following important qualities:

- Format
 - Problems are easy to read
 - Math uses math font and text uses text font
 - Inline equations and newline equations are used appropriately
 - Problem statements are included and your solutions are clearly separated from the problem statements
- Writing
 - Student uses complete sentences
 - Student only includes necessary information
 - Student states assumptions and named theorems
 - Student uses definitions and theorems appropriately (without quoting them word-for-word)
 - Student uses variables appropriately
 - * Student does not use the same variable for multiple purposes
 - * Student treats uppercase and lowercase variables as distinct
 - Student uses precise language
 - Student is honest about logical gaps/imprecision
 - Student does not include examples unless asked for them

- Student’s equations flow left-to-right
 - Student discriminates between assumptions and implications
- Reasoning
 - Student avoids logical errors
 - Student justifies logical steps/implications
 - Student uses appropriately sized logical steps
 - Student puts logical steps in a linear sequence
 - Student does not include extraneous reasoning
 - Student avoids arithmetic errors
 - Student correctly uses contrapositive or contradiction
 - Student includes all cases
 - Student uses precise language
 - Student checks all necessary details
 - Student completes the argument
 - Important: Student does not assume what needs proved
 - Student uses definitions correctly
 - Student avoids unwarranted assumptions
 - Student avoids conflating an implication with its converse.

Note: Qualities marked “important” above count for two qualities in the below rubric. Also note that the format category will apply to an entire assignment where the writing and reasoning category apply to each graded problem. Each category will be worth 5 points. Here is what each grade means:

0. None of the below grades applies (e.g. more than four of the previous qualities needs improvement).
1. Four of the previous qualities could use improvement OR two qualities could use improvement and one quality needs lots of attention OR two qualities need lots of attention.
2. Three of the previous qualities could use improvement OR one area needs lots of attention and one area needs improvement.
3. Two of the previous qualities could use improvement OR one area needs lots of attention.
4. One of the previous qualities could use improvement.
5. None of the previously listed qualities needs improvement.

Note: solutions which are missing a substantial amount of work (possibly because they are incomplete or because of a logical error) will be capped at three points in both the writing and reasoning categories.

7.3 Course Portfolio

In place of a midterm exam, you will instead submit a midterm portfolio. This will be due on Friday, May 6 (week 6). It will be formatted (and graded) like homework assignments, but you will not be allowed to discuss the problems with others, you will not be allowed to use the internet for help with the problems, and there will be no peer review component. The portfolio will be cumulative in the sense that it will require you to know and use material from everything you’ve learned in the class up until that point.

7.4 Final Paper and Presentation

At some point early during the term, you will be asked to choose a group with whom you will write a paper and give a presentation on a number theory topic which will not be covered in lecture. Groups will include two or three students, all of whom must contribute to both the presentation and the paper. Topics, a rubric, a schedule, and additional details will be provided in a separate document during week 1. Presentations will occur in class during week 10. Final papers will be due on **Friday, June 3** (week 10).

7.5 Absences

IF YOU ARE SICK, STAY HOME. This includes illnesses other than COVID. No one wants your germs.

During the term, you may miss class for any reason at all without telling me. If you want to keep a good grade, however, it would behoove you to...

- ...find a way to make up your participation credit for that week. See 7.1 for more details.
- ...get any announcements for the day from me or one of your peers.
- ...get any notes for the day from Canvas or one of your peers.
- ...contact me if you are going to be absent for an extended period of time.

7.6 Late Work/Make Up Work

No late work will be accepted *if* you wait until after a deadline has passed to contact me. If you contact me ahead of time, I *may* be able to make arrangements for you to submit some work late. Generally, you may submit homework assignments up until solutions are posted, though you may not submit peer review assignments late. Since life happens sometimes and you miss deadlines sometimes, I will drop your lowest homework grade and your lowest peer review grade.

8 Things I Expect From You

- Communicate with me. Tell me what problems you're having and how I can help. This is why there's a "Feedback" discussion on the Canvas page—so you can give me suggestions about how I can improve the class! But this is only effective if you actually give me feedback.
- Read the textbook! It is incredibly helpful to have an idea of what's going to be talked about in class before you show up to class. Even just skimming the textbook ahead of time to know what terms you should expect to hear can turn difficult lectures into easy lectures.
- Spend the appropriate amount of time on this class. This is a 4 credit-hour course, which means that you should expect to spend 12 hours each week, including class time, for this class. If you find that you are not spending this much time on this class just by attending class, doing the homework, and reading the book, find other ways of spending time on this class: do extra problems out of the textbook, study with a group, or attend office hours.

9 Things You Should Expect From Me

- You should expect me to want you to learn. A trait that I find to be unfortunately too common, especially at large research institutions, is that instructors aren't invested in their students' success. You can expect me to care about your education and your learning of the material.
- You should expect me to communicate clearly with you about what I expect from you. If you have questions about how I grade or how I expect you to write your answers, please ask!
- You should expect me to have good reasons for setting the course policies to be what they are. I've been tinkering with course policies for over four years now and I'm still working on creating good course policies that help you learn. That said, none of my policies are perfect, so we may need to adjust some things as the term goes along. If you have questions about why course policies are the way they are, please ask!
- You should expect me to post solutions to assigned problems. I forget to post solutions more frequently than I'd like to admit. Please email me when I forget to post solutions to something.
- You should not expect me to be perfect, but you should expect me to make amends when I make mistakes. If you think I've fallen short in any way, please let me know and I'll make up for that mistake in a reasonable way.

10 Tips For Success

- Spend your time efficiently. One of the worst ways to spend your time is to go through your notes searching for relevant theorems and definitions for each homework problem you have. That will result in you spending lots of time searching and not much time learning. Instead...
 - Skim the textbook before class. This will help you absorb the lecture material in more depth and will save you time going through your notes later.
 - Review the lecture notes after class. This will also help you absorb the notes better as you put together the “big idea” of a given lecture.
 - * Reviewing the lecture notes means making sure that you can precisely state each definition and important theorem without referencing notes.
 - * Also take this time to make sure you understand what each definition and theorem *means*. Precisely quoting theorems is important for using them, but you also need to have some intuitive sense of what each theorem says and why it is significant.
 - Review the week’s lecture notes before looking at the homework problems.
 - If you have prepared properly, upon reading a homework problem, you should immediately know which (if any) theorems and definitions are immediately applicable. If something is applicable, apply it. If none are applicable, you’ll know that you need to fiddle a bit and maybe “have an idea” before you can apply something. This will save you a substantial amount of time on homework.
 - These are not the only things you should be spending your time on; practice problems, reading proofs, proof-reading your own proofs, and so on should also be a part of your weekly study routine.
- Know the vocabulary. Math is a language—in order to properly do math, you need to know how to read it, write it, and speak it.
 - On Canvas, you can find something called the “Frayer model” to help you learn vocabulary words with which you are struggling. The best way to learn vocabulary is to internalize each vocab term and understand why the definition is the way it is rather than merely memorizing the sequence of words which comprises its definition.
- If you are having a hard time completing a problem, you can make additional “simplifying assumptions” to demonstrate that you mostly know how to do the problem. For example if you need a number to be even, but are having a hard time showing it, you can say something like “I would like to show that n is even, but I don’t know how. Assuming now that n is even, we proceed to show...” This is better than making up a reason (which you know to be false) to claim that n is even since the former approach demonstrates honesty and self-awareness (for which you will be rewarded).
- Work with other students in the class periodically. If you are struggling, you may find that other students have a better idea of what you’re struggling with than I do, since they’ve learned the material more recently than I have. If you (think you) are doing well, you will find that explaining the concepts to other students will solidify your understanding of the material and identify gaps in your knowledge that you didn’t know were there.
- Put in the appropriate time and quality of work. If the time that you are spending on this class is broken up by distractions like roommates, TV shows, or computer or cell phone use, you will not get the same benefit from that time as you would have gotten without the distractions.
- Make use of office hours. You don’t have to have an appointment to attend office hours—you can just show up! I think there’s a perception among undergraduates that instructors don’t like holding office hours and whether or not this is true for other instructors, it is not true for me! I find office hours to be enjoyable since I can have more of a conversation with you, rather than lecturing at you as I do in class.
- Free tutoring may be available. There are two primary math tutoring resources on campus, the Math Library and the Teaching and Academic Engagement Center. You can find information about your tutoring options at the TAEC at <https://engage.uoregon.edu/tutoring>. You can find information about your tutoring options at the math library at <https://library.uoregon.edu/scilib/mathlib>.

6.2 Sample Worksheet

Below is the calculus worksheet that I reference in my statement of teaching philosophy in section 3. This worksheet was created and administered at the end of my Calculus III: Sequences and Series course in the spring term of 2021. The goal of this worksheet is to provide students with the necessary cognitive dissonance to connect course concepts that had not been covered near one another during the course.

The first section covers the components of series and gives students the opportunity to connect finite sums, partial sums of infinite series, and Taylor polynomials/terms/coefficients. Things should begin to click for the student when they transition from exercises 1.2 to 1.3, and from 1.8 to 1.9. Additionally, exercise 1.12a requires students to confront and resolve the cognitive dissonance between a sequence and its corresponding sequence of partial sums.

The second section covers series convergence and gives students the chance to connect the familiar series convergence tests with questions about the radius/interval of convergence for power series. The transition from exercise 6 to 7 should help students take their knowledge of convergence and divergence tests, and turn it into knowledge about the interval of convergence. Helping students learn where the radius/interval of convergence calculations come from in turn helps them retain that information long-term.

The third section allows students to see familiar calculus functions and practice finding series for those functions. However, it also helps students reverse that process and turn series back into familiar functions.

The final section covers remainder estimates and gives students the chance to compare those remainder estimates for numeric series and power series. The adjacency of these two topics helps students compare and contrast these two processes.

1 Components of Series

Ex 1 Write out every term of $\sum_{n=1}^5 \frac{1}{n^2 + 1}$

Ex 2 Write out every term of $\sum_{\ell=-1}^4 \sqrt{\ell + 1}$

Ex 3 Write out every term of $\sum_{k=0}^3 \frac{1}{k!} x^k$

Ex 4 Write out every term of $\sum_{r=0}^3 \frac{2^r}{3^r} x^{2r+1}$

Ex 5 Give the second term of $\sum_{n=1}^9 \frac{2}{3n}$

Ex 6 Give the third partial sum of $\sum_{s=1}^{\infty} \frac{2^s}{s+1}$

Ex 7 Give the fifth partial sum of $\sum_{t=0}^{\infty} \frac{t^2 - 1}{t!}$

Ex 8 Give the fourth partial sum of $\sum_{u=1}^{\infty} \frac{1}{u^2 \cdot 2^u} \cdot x^u$

Ex 9 The series $\sum_{u=1}^{\infty} \frac{1}{u^2 \cdot 2^u} \cdot x^u$ is the Maclaurin series for some function $f(x)$. Give the fourth Taylor polynomial of $f(x)$ centered at $a = 0$.

Ex 10 The series $\sum_{u=1}^{\infty} \frac{1}{u^2 \cdot 2^u} \cdot x^u$ is the Maclaurin series for some function $f(x)$. Give the fourth term in the Maclaurin series of $f(x)$.

Ex 11 The series $\sum_{u=1}^{\infty} \frac{1}{u^2 \cdot 2^u} \cdot x^u$ is the Maclaurin series for some function $f(x)$. Give the fourth Taylor coefficient for $f(x)$ centered at $a = 0$.

Ex 12 Consider the series $\sum_{k=0}^{\infty} a_k$ where $a_k = \frac{1}{2^k}$

- (a) Fill out the following table where a_k is defined above and S_k denotes the k th partial sum of the above series.

k	0	1	2	3	4	5	6	7	8
a_k									
S_k									

- (b) What is $\lim_{k \rightarrow \infty} a_k$?

- (c) What is $\lim_{k \rightarrow \infty} S_k$?

2 Convergence of Series

Ex 1 Does $\sum_{n=0}^{\infty} \frac{n}{n^3 + 1}$ converge or diverge?

Ex 2 Does $\sum_{k=0}^{\infty} \frac{k^3}{5^k}$ converge or diverge?

Ex 3 Does $\sum_{\ell=2}^{\infty} \frac{1}{\ell \sqrt{\ln(\ell)}}$ converge or diverge?

Ex 4 Does $\sum_{j=0}^{\infty} \frac{(-1)^j}{\sqrt{j+1}}$ converge or diverge?

Ex 5 Does $\sum_{a=1}^{\infty} \frac{\cos(3a)}{1 + (1.2)^a}$ converge or diverge?

Ex 6 Does $\sum_{b=2}^{\infty} \ln\left(\frac{2b+1}{2b+3}\right)$ converge or diverge?

Ex 7 Does $\sum_{n=0}^{\infty} \frac{(x+2)^n}{3^n}$ converge or diverge...

- (a) ...when $x = -1$?
- (b) ...when $x = 2$?
- (c) ...when $x = -3$?
- (d) ...when $x = -6$?
- (e) ...when $x = 1$?
- (f) ...when $x = -5$?
- (g) ...when $x = 0.99$?
- (h) ...when $x = -4.99$?

Ex 8 Use your answers to the previous question to answer this question. What is the interval of convergence for $\sum_{n=0}^{\infty} \frac{(x+2)^n}{3^n}$? How about the radius of convergence?

Ex 9 How does the interval of convergence for $\sum_{n=0}^{\infty} \frac{(x+2)^n}{(n+1) \cdot 3^n}$ compare to the interval of convergence in the previous problem? How about the radius of convergence?

Ex 10 How does the interval of convergence for $\sum_{n=1}^{\infty} \frac{(x+2)^n}{(n+1)^2 \cdot 3^n}$ compare to the interval of convergence in the previous problem? How about the radius of convergence?

3 Functions and Series

Ex 1 Let $f(x) = \frac{1}{1-x}$.

- (a) Find a power series which converges to $f(x)$. (Yes, this is as easy as it looks.)
- (b) Using the definition of the Maclaurin series, find the Maclaurin series for $f(x)$.

Ex 2 Find the Maclaurin series for each of the following functions. Also include *an interval on which that series converges*. You may use whatever methods you like, but you should practice using the geometric series at least once and using the definition of the Maclaurin series at least once.

- (a) $\frac{x^2}{1+x}$
- (b) $\arctan(x^3)$
- (c) xe^{2x}
- (d) 10^x
- (e) $\frac{21}{(10-x)(1+2x)}$

Ex 3 Find an explicit formula (i.e. give a formula for the function that doesn't use a series) for each of the following series.

- (a) $\sum_{n=0}^{\infty} x^n$
- (b) $\sum_{n=1}^{\infty} x^n$
- (c) $\sum_{n=0}^{\infty} \frac{3 \cdot x^n}{4^n}$
- (d) $\sum_{k=0}^{\infty} (-1)^k x^{2k}$
- (e) $\sum_{r=0}^{\infty} e^{rx}$

4 Remainder Estimates

Ex 1 Consider the series $\sum_{s=1}^{\infty} \frac{2s}{s+7}$. Using sigma notation, write out R_3 . Write down the first four terms of R_3 .

Ex 2 Consider the power series $\sum_{k=1}^{\infty} -\frac{x^k}{k}$. This is the Maclaurin series for $\ln(1-x)$.

- (a) Write down the second Taylor polynomial for $\ln(1-x)$.
- (b) Graph $\ln(1-x)$ and the second Taylor polynomial for $\ln(1-x)$ on the same axes.
- (c) Write down (without using an infinite sum) the function $R_2(x)$.
- (d) Write a sentence describing what $R_2(x)$ represents.
- (e) Using a calculator, compute $R_2(1/2)$, $R_2(-1/2)$, $R_2(1/10)$, $R_2(-1/10)$, and $R_2(0)$. How does the size of $R_2(x)$ change as x approaches 0?

Ex 3 Consider the series $\sum_{n=0}^{\infty} \frac{3n^2}{1+n^6}$.

- (a) Find k so that the k th partial sum of $\sum_{n=0}^{\infty} \frac{3n^2}{1+n^6}$ is within 0.00001 of the actual sum.
- (b) Use your favorite computational software to give the corresponding approximation of the actual sum.

Ex 4 Consider the series $\sum_{\ell=0}^{\infty} (-1)^{\ell} \frac{1}{\sqrt{\ell^{3/2} + 1}}$.

- (a) Find k so that the k th partial sum of $\sum_{\ell=0}^{\infty} (-1)^{\ell} \frac{1}{\sqrt{\ell^{3/2} + 1}}$ is within 0.00001 of the actual sum.
- (b) Use your favorite computational software to give the corresponding approximation of the actual sum.

Ex 5 Consider the power series $\sum_{k=1}^{\infty} -\frac{x^k}{k}$. This is the Maclaurin series for $f(x) = \ln(1 - x)$.

- (a) Use Taylor's estimate to find an upper bound for $|R_1(1/2)|$.
- What are x, a, I , and k ?
 - What is $f''(z)$?
 - Find an upper bound for $|f''(z)|$ for $z \in I$.
 - Why is the previous part important?
- (b) Use Taylor's estimate to find an upper bound for $|R_3(1/2)|$.
- (c) Find a value of k so that $|R_k(1/2)| < 0.0001$.
- (d) Find a value of k so that $|R_k(x)| < 0.0001$ for each $x \in [-1/2, 1/2]$.

6.3 Sample Project Instructions

Below is the set of instructions I gave for the final project in my Fundamentals of Number Theory II course in the spring term of 2022. The structure of this document was inspired by the UO Student Teaching Seminar's discussion on project-based learning and so the document includes:

- project objectives so that the students know what to focus on learning,
- a project timeline so that students know when things are due, can plan ahead, and make incremental progress throughout the term,
- a list of specifications for the presentation and paper,
- a rubric for each graded component of the project,
- principles for good expository writing,
- a list of possible topics, including notes on any additional background material that students would find helpful, and
- a list of resources to help students with the technological component of the project.

Final Paper and Presentation

Math 348

Spring 2022

1 Objective

There are three primary objectives for this project.

First, this project serves as a way for you to explore a number theory topic in more depth than we otherwise would in class. You'll be exploring a more advanced topic and you'll have a chance to examine some research-level mathematics, up to and including some open research questions.

Second, this project will allow you to practice math as a spoken language. You already practice speaking math when doing group work in class or when working on homework with others, but each of those is a two-way conversation where imprecise language is acceptable. In the presentation portion of the project, you will be practicing explaining math to someone else in a formal setting.

Third, this project gives you the opportunity to write exposition. Exposition differs substantially from the type of writing you do on homework. Your writing on homework ought to be as concise as possible: only include required information, don't provide examples unless asked for them, cite theorems rather than quoting them, and so on. Expository writing is generally longer and the point is give your reader a good big-picture understanding of your topic. Good principles for expository writing are given below.

2 Timeline

Week	Date	Description
2	Wednesday, April 6	Topic and Group Preferences Due
5	Wednesday, April 29	Progress update due
8	Wednesday, May 18	First draft of paper due
10	Any class day	Presentation
10	Friday, June 3	Paper due

2.1 Topic and Group Preference

By Wednesday, April 6, please send me an email (gknapp4@uoregon.edu) including your topic preferences and your group preferences. Topics will be assigned on a first-come first-serve basis. If you have a group preference, each member of the group must email me indicating that preference. For example, if Harry, Ron, and Hermione want to be a group, Harry needs to email me requesting Ron and Hermione, Ron needs to email me requesting Harry and Hermione, and Hermione needs to email me requesting Harry and Ron.

2.2 Progress Update

Your progress update in week 5 should include a detailed outline of your proposed paper, including a bibliography. The outline should describe which sections will be included in your paper and the author of each section. Each section should be accompanied by a brief description written by that author.

This update will be graded for completion. I will provide feedback on your progress and suggest sources and subtopics that may be of interest.

2.3 First Draft

The first draft of your paper should be 80–90% complete. This draft will be graded for completion and I will provide feedback on the content and writing.

3 The Presentation

Your presentation may either be a (non)traditional “chalk talk” (either at the board or via the projector) or a slideshow. The technology and setup for a chalk talk is much simpler, though you’ll find that it’s much harder to get through the material you want to cover in the appropriate amount of time. The technical setup for a slideshow is much more involved, but the presentation is much smoother.

The presentation will be on either Wednesday or Friday of week 10. You will be sharing the class period with one other group, so you should plan to give a 20 minute talk and leave about 5 minutes for questions.

4 The Paper

4.1 Format and Length

The final paper should be formatted as follows:

1. Use LaTeX!
2. Use 1 inch margins
3. Use 12 point (or smaller) font. This can be accomplished by passing the “12pt” option to the document class at the beginning of the preamble, i.e. including the command “\documentclass[12pt]{article}”
4. Single space. You may choose to indent paragraphs or you may also choose to put a blank line between paragraphs (or both).
5. Follow all formatting requirements and good practices for homework
6. Make sure to number any equations you reference. Make sure any equations you do not reference do not have a number (i.e. an equation should be numbered if and only if it is referenced).
7. Your bibliography should use an industry-standard citation format. It doesn’t matter whether you use MLA, APA, IEEE, BiBTeX’s “plain” style, etc. But pick one and stick with it.
8. Each group member should write at least three pages. This may include equations and figures unless those equations and figures take up a “substantial” amount of room. If you have questions about the definition of “substantial,” ask. I’d rather deal with that on a case-by-case basis.

4.2 Writing

The final paper should be written with the following good practices:

1. Follow all writing requirements for homework outlined in the syllabus EXCEPT
 - Student only includes necessary information
 - Student does not include examples unless asked for them

Note that it is, in fact, a good idea to include more information than necessary and to include examples for this project

2. Write in the first-person plural (e.g. “we will show that”), though you may address the reader as “you.”
3. Edit your writing: avoid typos and mathematical mistakes

4.3 Content

The final paper should include the following content:

1. An introduction that gives background and motivation for the topic at hand
2. A mathematically rigorous body. You don’t need to prove every assertion you make, but please define any new terms carefully. You are encouraged to use examples, data tables, illustrations, etc. to make your results easier to understand.
3. A conclusion. Remind the reader of the big ideas from your paper and suggest further questions for the reader to think about.
4. A bibliography.

5 Rubric

5.1 Progress Update

It is possible to receive grades in between the grades listed in this table.

Progress Update	5/5	2/5	0/5
Outline	Authors include a detailed description of which topics they’ll be writing about and who will be writing about each topic	Authors include a list of which topics they’ll be writing about and who will be writing about each topic	Authors do not include an outline
Bibliography	Authors provide a potential list of sources which includes at least two more sources than I included in my email. The list of sources is formatted consistently and includes the title, author, and type of source, along with a brief description of how the authors plan to use each source.	Authors provide a potential list of sources which may be difficult to read or may lack a description of how the authors plan to use those sources.	Authors do not include a bibliography.

Note: formatting of your bibliography is unimportant for your progress update. Just make it consistent and clear. You don’t even need to pick anything like MLA or APA or whatever.

5.2 First Draft

It is possible to receive grades in between the grades listed in this table. Note that this rubric applies to a particular student rather than to an entire group (so as not to penalize entire groups if a single member doesn't complete their work on time).

First Draft	5/5	2/5	0/5
Quantity	Student has at least two pages of drafted material and a clear plan for a third page.	Student has at least one page of drafted material	Student does not have drafted material
Quality	Student uses complete sentences and good reasoning with few exceptions. Student is honest about missing details.	Student's work is rushed, consistently difficult to read, or incomplete.	Student does not have drafted material.
Bibliography	Bibliography is formatted consistently and includes complete citation information. Bibliography contains at least two more sources than I included in my email.	Bibliography may be formatted inconsistently and may lack source information.	Bibliography is incomplete and formatted inconsistently.

Note: you may choose an appropriate style for your bibliography. I recommend using BiBTeX and using the “plain” or “unsrt” BiBTeX styles. If you prefer something like MLA or APA or IEEE, you are welcome to use that.

5.3 Final Paper

The following categories will be used to grade the final paper. It is possible to receive a grade not listed in this table. Notice that some categories are individual where other categories apply to the entire group.

Category (Point Value)	100%	50%	0%
Reasoning (40)	Every claim student makes is accurate and well-reasoned	Student makes multiple inaccurate, misleading, or unjustified statements	Student's statements are generally inaccurate or unjustified.
Writing (40)	Student's writing adheres completely to the writing guidelines in section 4.2.	About 75% of student's writing adheres to writing guidelines in section 4.2.	No more than 50% of student's writing adheres to writing guidelines in section 4.2.
Formatting (12)	Group's formatting adheres completely to the formatting guidelines in section 4.1.	Group's formatting adheres to some guidelines in section 4.1.	Group's formatting does not adhere to guidelines in section 4.1
Content (16)	Group adheres to content guidelines in section 4.3.	Group mostly adheres to content guidelines in section 4.3.	Group is missing some major component of the content listed in section 4.3.
Cohesiveness (16)	Group's paper transitions effectively from topic to topic independent of author.	Group's paper and transitions may be disconnected in places.	Group's paper reads like several different papers stapled together.
Bibliography Format (8)	Bibliography is formatted correctly according to an industry standard citation format.	Bibliography may be formatted inconsistently or may be formatted without reference to an industry standard format.	Bibliography is incomplete and formatted inconsistently.
Reference Quantity (8)	Group references at least two sources beyond what I sent in my email.	Group references one source beyond what I sent in my email.	Group's references are all from my email.
Reference Quality (8)	Group's references are from reputable sources.	Group's references rely heavily on questionable sources (e.g. Wikipedia)	Group exclusively relies on questionable sources.
Reference Usage (12)	Group cites each reference in bibliography. Group regularly uses references when appropriate.	Group does not cite all sources in bibliography or group does not use references when necessary.	Group cites only some sources in bibliography and does not use references when necessary.

5.4 Final Presentation

As with the other rubrics, intermediate point values are possible. Everyone in the group will probably receive the same grade, but exceptions are possible.

Category (Point Value)	100%	50%	0%
Clarity (30)	Presented materials are easy to read. Group defines necessary terms and notation and uses terms and notation properly.	Presented materials are hard to read OR group lacks precise definitions of terms/notation OR group uses terms/notation improperly.	Presented materials are hard to read AND group lacks precise definitions of terms/notation AND group uses terms/notation improperly.
Accuracy (30)	Presented content is entirely factual.	Presentation includes minor mistakes or misleading statements.	Presentation includes major mistakes.
Motivation (15)	Presentation includes motivation for why the chosen topic is of interest.	Presentation may mention why the chosen topic is of interest.	Presentation does not indicate why the chosen topic is of interest.
Big Idea/Main Result* (15)	Presentation presents a clear big idea/main result.	Presentation may be fractured into small, yet related pieces.	Presentation has no clear direction.
Balance (10)	Everyone in the group speaks for roughly equal amounts of time	Some group members speak noticeably more often than others	Some group members clearly dominate the presentation

*Note that the “big idea/main result” does not have to be a single theorem or result; it can be a philosophy like “analysis is a useful tool for studying primes.”

6 Progress Update Exemplars

Suppose Harry, Ron, and Hermione are doing their project on partitions. Here are some exemplars to indicate what different levels of a progress update might look like.

A 10/10 Progress Update

The partition function is one of the most fascinating topics in mathematics. On one hand, it answers a simple question: given a positive integer n , in how many distinct ways can you sum positive integers to yield n ? On the other hand, it is one of the most difficult functions in mathematics and is still the subject of much modern research. Historical greats like Euler, Hardy, and Ramanujan have made major contributions by creating or taking advantage of cutting-edge mathematics (generating functions in Euler’s case and complex analytic methods in Hardy and Ramanujan’s). Modern mathematicians like Ono have used the theory of modular forms with great success as well. Still, many questions about partitions (especially restricted partitions) remain open. In this project, we will explore the theory of partitions through Ferrers diagrams, generating functions, and computation.

Introduction

We will together write the introduction to this project in which we motivate why people might be interested in the partition function. We will rigorously define the partition function and we will describe why the partition function is defined the way it is. We will describe restricted partition functions and give the corresponding notation. We will summarize some of the history of partition functions and state important results.

Ferrers Diagrams

Harry will write the portion of this project about Ferrers diagrams. He will define a Ferrers diagram, give examples, and give a proof demonstrating the utility of the Ferrers diagram. Harry will also write about generalizations of the Ferrers diagram like the Young tableaux and plane partitions and will list some techniques, results, and open questions associated to Ferrers diagrams.

Generating Functions

Ron will write the portion of this project about generating functions. He will define generating functions, give examples, and give a proof demonstrating the utility of generating functions. He will focus on how generating functions have been used in partition theory, but will also mention applications of generating functions to fields like differential equations. He will also write about analogues of generating functions, like Dirichlet series.

Computational Results

Hermione will write the portion of this project about computations and algorithms related to the partition function. She will describe some of the history of how people computed $p(n)$ before computers existed, including how asymptotic formulas shaped the development of some of these algorithms. She will describe how recurrence relations have impacted computations, in particular, Euler's Partition Formula. She will also provide some code she has written to compute various restricted partitions functions along with table summarizing the data she developed.

Sources

Rosen, Kenneth H. *Elementary Number Theory & its Applications*. Textbook.

We will use Rosen's textbook to formulate an outline of our project and we will give more detailed versions of several proofs found in Rosen; namely, the proof of the factorization of the generating function for $p(n)$ and the proof of Euler's pentagonal number theorem.

[More sources here]

A 4/10 Progress Update

The partition function, $p(n)$ counts the number of ways to add up positive integers to get n . In this project, we will examine the partition function through Ferrers diagrams, generating functions, and computation. Harry will write the segment of the paper about Ferrers diagrams, Ron will write the segment of the paper about generating functions, and Hermione will write the segment of the paper about computation.

Here are the sources we will use:

Rosen, Kenneth H. *Elementary Number Theory & its Applications*. Textbook.

[More sources here]

7 Writing Principles

When doing math writing in general, you want to have the answers to two question in mind:

1. What is the purpose of this writing?
2. Who is the audience of this writing?

The answers to these questions impact every decision you make about the writing itself. In general, you are probably most familiar with writing homework assignments. On homework assignments, the audience is your grader/instructor and the purpose of the writing is for you to practice working with and communicating about new concepts to which you were exposed in class. As a result, the best type of homework writing is information-dense in the sense that you want to prove exactly what you were asked to prove and no more. After all, it is a mark of mastery to say exactly what you want in as few words as possible.

You're probably also quite familiar with the type of math writing that you see in textbooks. The audience of a textbook is often "a student who has met all of the prerequisites to learn about this topic in detail" and the purpose of the textbook is to teach the reader in detail about a topic so that the reader leaves the book with a certain new skill set that they didn't already have before.

With this project, however, the answers to the two fundamental questions changes. You want to give a lot more room for discussion than you otherwise would on a homework assignment. You don't want to give the same level of detail and depth that a textbook would, but you do want to give a lot more breadth and context. To see why, we'll talk about choosing a purpose and audience. The purpose and audience are somewhat tied together here, so let's start by discussing audience.

For your audience, you may assume that your reader is one of

1. A general undergraduate math student who has taken an intro proof course, an intro number theory course, and an intro computer programming course
2. A general math graduate student who has taken all of the above and courses in abstract algebra, real and complex analysis, and point-set topology

I recommend choosing "general undergraduate" as your audience, but some of you may have topics that are difficult to introduce without assuming that your audience has some familiarity with groups, fields, absolute convergence, or some other such concept that you don't have space to introduce in your paper.

Once you have your audience in mind, you'll want think about the purpose of your writing.

- Why should your audience care about your topic? Is it seemingly simple but deceptively complicated? Does it have really important applications? Is it analogous to an object that everyone is familiar with but different in some crucial way?
- What are the big ideas that you want your audience to walk away with?
- What are some of the clever techniques that are used when doing math in this area?
- What are the major accomplishments in this area?

It's impossible to focus on all of these questions, but you will at least want to touch on all of them in a meaningful way. So while you won't be writing with just one purpose in mind, each paragraph should probably correspond to just one purpose. Once you've chosen a purpose for a particular paragraph, however, you can begin to see that your writing will differ substantially from homework writing.

When writing homework problems, you don't need to give clear definitions because the grader already knows the terms you're using. Here, the audience (including me, the grader) might not know new terms and so

you'll want to make sure to define those terms carefully. This probably includes some exposition about why the definition includes the components that it does. E.g. if you're writing about the ElGamal cryptosystem and you want to define a discrete log, you might say something like

The idea behind defining a discrete log is the same as the idea behind defining the usual logarithm $\mathbb{R}_{>0} \rightarrow \mathbb{R}$. The standard logarithm is defined so that $\log(a)$ is the unique x so that $e^x = a$. When defining the discrete logarithm mod m , we want to define $\log_b(a)$ to be the unique x so that $b^x \equiv a \pmod{m}$, but we require some conditions.

First, we need to guarantee that such an x exists. Such an x cannot be guaranteed if b and a are not relatively prime to m , for instance. There is no solution to $3^x \equiv 2 \pmod{6}$ after all. Hence, we only define $\log_b(a)$ for $b, a \in (\mathbb{Z}/m\mathbb{Z})^\times$. Even so, such an exponent might not be guaranteed to exist as we can see by the fact that there are no solutions to $7^x \equiv 5 \pmod{9}$. Hence, we further require b to be a primitive root modulo m .

Under these conditions (that b is a primitive root mod m and that a is relatively prime to m), there is guaranteed to be an x so that $b^x \equiv a \pmod{m}$ (see Theorem Blah that we proved earlier). However, such an x is not unique. Note that $x = 2, 8, 14, 20, \dots$ are all solutions to $2^x \equiv 4 \pmod{9}$. However, since the order of 2 mod 9 is 6, any exponent x satisfying $2^x \equiv 4 \pmod{9}$ must be unique modulo $6 = \varphi(9)$. More generally, with a primitive root whose order is $\varphi(m)$, any x satisfying $b^x \equiv a \pmod{m}$ must be unique modulo $\varphi(m)$. Now that we understand some of the obstacles to making this definition, we proceed to give the definition:

Definition 1. Suppose m is an integer greater than 1 and b is a primitive root modulo m . For any a in $(\mathbb{Z}/m\mathbb{Z})^\times$, define the index (or discrete logarithm) base b of a modulo m to be the residue class modulo $\varphi(m)$ of any x with $b^x \equiv a \pmod{m}$.

Only including the definition of “index” could leave your reader confused about a lot of the details like the “why”s and the “how”s.

Another thing that you'll want to notice is that when you want to pass on big ideas or clever techniques, it can often be helpful to give that in the context of an example rather than the general case. In fact, when passing on a big idea, it is often impossible to give the full idea without getting too deep into the weeds. In that case, it may be helpful to present an example and give some commentary on where the specific details of the example fail to generalize.

Notice also that the purpose of this assignment is to get you to practice audience-centered writing rather than self-centered writing. When you complete homework assignments, your purpose is to demonstrate your understanding of the problems and hence is self-centered. Here, your writing ought to be audience-centered where you put their understanding above your need to demonstrate mastery. This setting is somewhat contrived, of course, because ultimately you are being graded and so you want to demonstrate some mastery, but you're being graded on your ability to write audience-centered mathematics, so I hope that provides some authenticity to this assignment. Moreover, I plan to post each of your papers to Canvas so that your classmates may read them and use them as a reference should they want to do so in the future.

Of course, these are not the only things you'll want to consider when writing math. More good practices for writing mathematics can be found at this link: <https://kconrad.math.uconn.edu/blurbs/proofs/writingtips.pdf>. Note that these are Keith Conrad's opinions, but they constitute an excellent description of modern mathematical convention, they are well-reasoned, and he's honest when his opinion isn't necessarily universally agreed upon.

8 Some Details

8.1 Possible Topics

You may choose any of the following topics and you may also propose a topic yourself if there's something you're curious about! Note that “topic**” denotes a topic requiring abstract algebra, “topic++” denotes a topic requiring analysis, and ([topic]) denotes a topic about which I have fewer resources to share.

- Algebraic number fields**: factorization of ideals, class numbers
- Approximations by rational numbers: how well do rational numbers approximate irrational numbers?
- ([Bernoulli numbers]): a very mysterious pattern, 400 years old at least
- ([Bounded gaps between primes]): an exciting, recent discovery
- Continued fractions: representing real numbers in the form $a_0 + \cfrac{1}{a_1 + \cfrac{1}{a_2 + \cfrac{1}{a_3 + \ddots}}}$
- Elliptic curves**: ubiquitous in modern research, including the proof of Fermat's last Theorem
- ([Factoring algorithms]): highly applicable and clever
- Finite fields**: elegant results used across number theory
- Geometry of Numbers (Lattices): number theory that you can visualize
- Goldbach's conjecture: easy to state, still unproven! Relates additive and multiplicative number theory
- Lagrange's Four Square Theorem: A surprising pseudo-converse to the fact that every perfect square is nonnegative
- Modular forms++**: feels closer to algebra/analysis than number theory, but has massive number theoretic consequences
- Multiplicative functions and Möbius inversion: beyond Euler's φ function
- p -adic numbers++**: a different way of measuring distance
- Partial summation and some consequences: one of the most useful ways of computing finite sums; turn them into integrals!
- Pell's equation: a neat example of solving a polynomial equation in integers
- ([Primality testing algorithms]): these can be fast!
- Primes in arithmetic progressions++: incredible results
- The Prime Number Theorem: for any positive number t , (approximately) how many primes are $\leq t$?
- ([Special Cases of Fermat's Last Theorem]): for cubes, fourth powers, etc.
- Riemann zeta function++: essential for understanding primes
- ([Twin primes and Brun's sieve]): a challenging and beautiful result

8.2 Technology

For your final paper, it is probably best to collaborate on Overleaf. You can share and collectively edit a single .tex document on Overleaf with very little hassle. You can also use a more complicated solution like GitHub, but I can't provide tech support if you choose to go that route.

For the bibliography of your final paper, I recommend that you use BiBTeX. This is a great tool for formatting your bibliographies and it makes reformatting them a breeze. Here is Overleaf's BiBTeX tutorial; it's excellent: https://www.overleaf.com/learn/latex/Bibliography_management_with_bibtex

For your final presentation, if you choose to do a slideshow, you'll want to look at the beamer package in LaTeX. It makes very nice looking slideshows. Rather than trying to put together my own introduction to beamer, I will link you to the experts: [https://www.overleaf.com/learn/latex/Beamer_Presentations%3A_A_Tutorial_for_Beginners_\(Part_1\)%E2%80%94Getting_Started](https://www.overleaf.com/learn/latex/Beamer_Presentations%3A_A_Tutorial_for_Beginners_(Part_1)%E2%80%94Getting_Started)

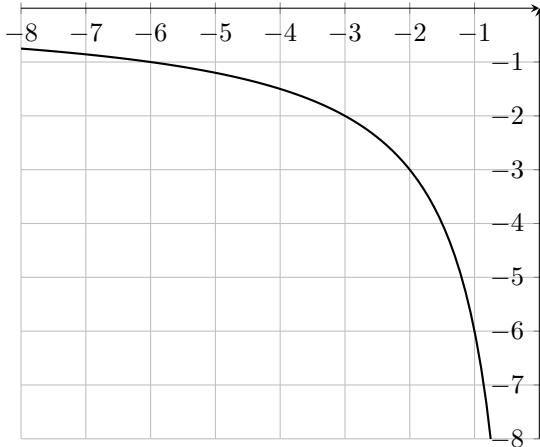
6.4 Sample Exam

Below is a sample exam from my Integral Calculus course in the fall term of 2021. On this exam, I test multiple areas of Bloom's Taxonomy, from knowledge (the vocabulary section) to understanding (problem 3) to applying (problem 9) to analyzing (problem 6) to evaluating (problem 4) to creating (problem 7). Note that extra spaces from the exam have been removed in order to save space in this document.

Exam 1

1. Vocabulary

- (a) (8 points) Let $f(x)$ be a continuous function on the interval $[a, b]$. State both versions of the **Fundamental Theorem of Calculus** (it doesn't matter which order you state them in):
- i.
 - ii.
- (b) (4 points) State the **integral power rule**.
2. (4 points each) True or false? For each statement, *circle* the word "true" if the statement is true and "false" otherwise. No work is necessary, but you can show work for some partial credit if you get the answer wrong.
- (a) **True or False?** If $f(x)$ is a continuous function on $[a, b]$, then the right Riemann sum with 5 rectangles for $f(x)$ on $[a, b]$ has to be greater than or equal to $\int_a^b f(x) dx$
- (b) **True or False?** If an object travels a distance of 8 meters, then its net displacement could be 5 meters.
- (c) **True or False?** If $g(x)$ and $h(x)$ are differentiable functions, then $\int_a^b g'(h(x))h'(x) dx = 0$.
- (d) **True or False?** The sums $\sum_{i=10}^{100} 2^i$ and $\sum_{i=0}^{90} 2^{i+10}$ are equal.
3. (5 points) Is $\frac{x^2}{2} \sin(x)$ an antiderivative of $x \cos(x)$? Why or why not?
4. (5 points) Briefly explain why the expression $\int_{-3}^3 \frac{1}{u^2 + 1} dx$ does not make sense.
5. (3 points) Compute $\frac{d}{dx} \int_0^5 \frac{t}{t^7 + 1} dt$
6. Below is the graph of the function, $f(x) = \frac{6}{x}$



- (a) (4 points) On the graph, draw the rectangles which correspond to the left Riemann sum with four rectangles for $f(x)$ on the interval $[-3, -1]$.
- (b) (4 points) Compute the left Riemann sum with four rectangles to approximate $\int_{-3}^{-1} f(x) dx$. You can use your picture in part (a) to help.

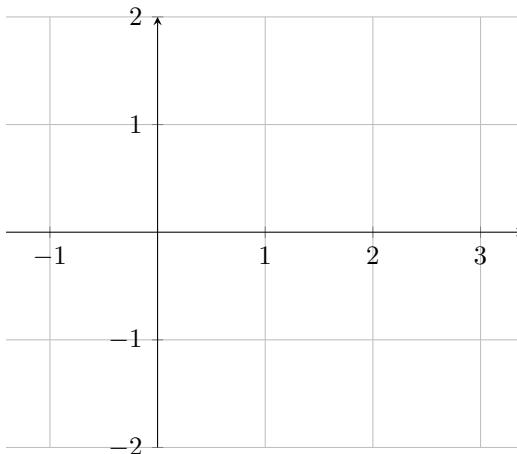
Exam 1

7. (6 points) On the below axes, draw the graph of a function $g(t)$ with the following properties:

(a) $g(t)$ is continuous on $[-1, 3]$

(b) $\int_{-1}^1 g(t) dt < 0$

(c) $\int_{-1}^3 g(t) dt > 0$



8. (a) (8 points) Compute $\int_1^7 \sqrt{9 - (x - 4)^2} dx$

(b) (12 points) Use your answer from part (a) to compute $\int_1^7 \sqrt{9 - (x - 4)^2} + \frac{x}{x^2 + 1} dx$

If you didn't get an answer in part (a), make one up and then use it here!

9. (14 points) t years after January 1, 2020, the rate of change in the number of members of a family of river otters is approximately $\frac{e^{1/t}}{t^2}$ otters per year. If there were 12 otters in the population on January 1, 2022, how many otters will there be in the family on January 1, 2025?

7 Teaching Evaluations

7.1 Professional Reviews

My teaching has been evaluated once during my postdoctoral appointment at the University of Calgary (fall 2024), and I was formally evaluated during four of my six years as a graduate student at the University of Oregon. I was originally scheduled to be evaluated during the spring term of 2020, but this was canceled due to the COVID-19 pandemic. I was not evaluated during the 2022–2023 academic year.

Each of the following sections describes my evaluation. Before the evaluation, the faculty member reviewed my syllabus (if relevant). Then, the faculty member would attend one of my classes. Afterwards, I met with the faculty member and discussed their feedback.

Calculus for Business and Social Science I, Winter 2018

In this course, I was a teaching assistant and Dr. Mike Price sat in on one of my discussion sections. The lead instructor for the course had provided me with a rough outline for how to structure the discussion section, so I only had control over the implementation of that structure.

Organization	← Needs Improvement	Satisfactory	Nearly → Perfect
begins class on time in an organized, orderly fashion		X	
clearly states the goal or objective for the period		X	
reviews prior class material to prepare students for the content to be covered		X	
provides internal summaries and transitions		X	
summarizes and distills the main points at the end of class		X	
appears well prepared for class			X
Presentation			
blackboard writing is large, legible, well organized		X	
speech fillers, for example, "ok, um" are not distracting			X
speaks audibly and clearly			X
communicates a sense of enthusiasm and excitement toward content			X
use of humor is positive and appropriate			X
presentation style facilitates note taking		X	
establishes and maintains eye contact with class		X	
talks to the class, not to the board or windows		X	
varies the pace to the difficulty level of material		X	
Rapport and Interaction			
acknowledges students for contributions that deserve commendation		X	
encourages student thought and participation		X	
uses student names			
treats class members equitably		X	
listens carefully to comments and questions		X	
repeats/rephrases questions for class		X	
answers student questions clearly and directly			X
allows ample opportunity for questions		X	
Credibility and Control			
demonstrates content-competence			X
uses authority in classroom to create an environment conducive to learning		X	
Content			
includes graphical illustrations		X	
selects examples relevant to student experiences and course content			X
relates current content to what's gone before and what will come after			X
seeks to apply theory to problem solving			X
explains difficult terms, concepts, problems in more than one way			X
clearly identifies assignment expectations		X	

Students present: 26 / Students enrolled: 31

Topic: Quiz topics on concepts of differentiation with product/quotient/chain rule; implicit differentiation; quiz

Comments on Successes

- Good introduction to weekly focus items; can a brief summary be written on board as well?
- Interesting conceptual quiz questions, are these ones you write on your own or as provided by lead instructor?
- Good check in about whether students wanted additional problems done before they start on their own work
- The analogy about d/dx as an action to take is a good distinction, although a hard one for them to grasp (you could relate it to an operation they're familiar with, e.g. "multiplying by d/dx is like multiplying by a plus sign, it just doesn't make sense") – often the subtlety between the term $\frac{dy}{dx}$ and the operator $\frac{d}{dx}$ is what trips them up

Suggestions for Improvement

- Especially for a quiz that students have already worked on, ask for student contributions in solving individual exercises
- Similar comment for working on new exercises, at least a couple of students were eager to contribute to its solution, use them and invite others to answer little components (e.g. "what's the derivative of this constant?"), they should know the answer, but it paces it out so they are with you
- Structure of discussion is largely determined by lead instructor, so we omit a conversation about use of class time

Observed instructor: I have had the opportunity to look over this review and a copy was made available to me.

Reviewer Signature:



Observed Instructor Signature:



Differential Calculus, Winter 2019

This was the first calculus course for which I was an instructor of record. Unfortunately, I never received a formal copy of the evaluation, and the UO math department subsequently lost the records, but the evaluator (Dr. Liliana Pazdan-Siudeja) still had some notes from the session and was kind enough to send the following to me by email.

- You started and finished on time
- Your handwriting was clear (you used markers and a projector to work on a handout), nicely organized and neat and your presentation style facilitated note taking (you provided students with handout with extra space to write on)
- You knew names of some students and encouraged student thought and participation
- You answered student questions
- You demonstrated content-competence
- You included graphical illustrations (even using different colors of markers)
- You made connections between things that students have already learned (Chain Rule) and a graph of e^{-x} having no horizontal intercept (meaning $e^{-x} = 0$ has no real solution)
- You explained some concepts in more than one way (first derivative sign analysis done via graph and a sign change on a real number line)

My few suggestions were mostly regarding how to set up technology-related components, namely the projector was not doing very well with all lights on (that was in Deady 106) as there was not enough contrast and so dimmed lights would be advised, if possible. You also used different colors to emphasize different things (the sign change of f'), yet they were again almost indistinguishable due to lack of contrast while using the projector. My other remark was to allow students to help you to do some things (like factoring out $e^{-x} - xe^{-x} = 0$).

Integral Calculus, Winter 2021

This was the third course which I taught as an instructor of record over Zoom and I was evaluated by Dr. Peter Ralph. Dr. Ralph examined my course syllabus and webpage (on Canvas, the UO's learning management system) and sat in on my class. He then provided comments. Dr. Ralph noted that I was successful with my course organization, my rapport with my students, and my willingness to improve my pedagogy. He suggested that I spend more time in class talking about the big picture rather than the details. Here are his comments:



PETER RALPH
PHONE: (707) 502-5854
EMAIL: plr@uoregon.edu

Teaching review for **Greg Knapp**

February 16, 2021

To whom it may concern –

I am writing this teaching review on the basis of observing Greg Knapp's "Calculus II" class in Winter 2021, after attending a class (remotely) and reviewing teaching materials (on Canvas). In summary, I found Greg's class to be well-organized, and Greg's teaching and explanations to be very clear and well-illustrated. I was impressed with his teaching philosophy and his motivation to learn and work on good teaching practice.

Professional teaching: I was favorably impressed by Greg's course organization on Canvas, including comprehensive syllabus information, including learning outcomes, expectations, outlines of course assignments, tips for success, inclusivity, and accessibility. The Canvas site makes it easy to see what's due and what's expected in the class, and instructions are clear and reasonable. The activities are well-designed to encourage student learning, with questions that reflect the topics covered in class that week of various levels of difficulty. Homework solutions are provided. Greg has clearly put a lot of thought and work into structuring the class to be easy and clear to interface with.

Inclusive teaching: Expectations are outlines in the syllabus that provide flexibility, for instance, by allowing participation credit either through answering clicker questions or by engaging in discussion on Canvas. I especially liked the lists of "things I expect from you", "things you should expect from me", and "tips for success" on the syllabus, provided to make explicit the things students are expected to know (but might not). The statement on inclusivity in the syllabus is clearly sincere and supportive. In class (over Zoom), students asked questions either by video or chat, and Greg often explained things in more than one way (e.g., algebraically and visually). Greg has extremely clear diction and excellent "boardwork" (drawing electronically on a pdf).

Engaged teaching: I enjoyed discussing pedagogy with Greg after class - he's clearly thought a lot about it, and has many good (and research-informed) ideas. For instance, two innovative strategies are: a verbal assignment, where students explain how to do a problem to him, and giving students lists of vocabulary word topics as a way of checking understanding. Greg is also very engaged, enthusiastic, and accessible in class – students did not seem to have a problem asking questions or engaging with him (which is particular impressive in a zoom classroom). My main feedback for Greg was to spend a bit more time on the big picture – the class that I attended spent a lot of time in the details of particular examples (although at an appropriate pace and with a break) – however, this was a minor suggestion.

Research-informed teaching: As I mentioned above, Greg has actively worked on teaching pedagogy, joining discussion groups with other math department instructors. In particular, he's working on teaching math as a language, including awareness of vocabulary and creative thinking. Furthermore, he explicitly discussed teaching pedagogy during class, which can help students better learn how to learn. In class, when explaining new tools (when I observed, the topic was finding areas between two curves) he built up from simple tools to higher-level thinking, and dealt with mistakes well.

In summary, I found Greg to be very organized, engaged, and thoughtful teacher, actively working on his pedagogical practice, and running a good calculus class.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter Ralph".

Peter Ralph.

Fundamentals of Number Theory I, Winter 2022

This was the first proof-based math course I taught as instructor of record and I was observed by Dr. Ellen Eischen. Dr. Eischen provided comments on the class in which she sat in. She observed that I had a clear and well-organized lecturing format and successful student interaction during class, and she suggested that I spend more time engaging with students during class. Her full comments are here:

March 11, 2022

Re: Graduate Teaching Fellow Greg Knapp's Class

I observed Graduate Teaching Fellow Greg Knapp's Math 347 (Introduction to Number Theory I) class on Monday, February 28, 2022. This is a 50-minute-long number theory course aimed at undergraduates who are seeing the topics for the first time. The class was taught in a hybrid mode, with 10 students attending in-person and at least 4 students attending remotely. The day I visited, the lecture focused primarily on Wilson's Theorem. Overall, this was a well-taught class.

Strengths include:

- The entire lecture, which included interaction with students, progressed at an appropriate pace and was well-organized.
- Knapp appeared to be a calm and confident instructor, like someone who has a lot of experience teaching undergraduates and has reflected on best practices.
- Knapp projected well and had a clear voice. He also checked to make sure that people in the back of the classroom could see okay.
- Students appear to be comfortable asking and answering questions. Several students contributed questions or answers during the lecture I observed.
- Knapp did an excellent job motivating Wilson's Theorem. He said that his class's goal would be to motivate their study of quadratic reciprocity, and in turn, he linked quadratic reciprocity to some exercises students had already encountered on the homework.
- Knapp did an engaging interactive example in which students explored cases of Wilson's Theorem. Every student in the class, even two near the back who had originally been scrolling on the phones, got engaged in this example and discussed it with a partner. It was impressive to see all the students in the class work actively with a partner on the exercise. One student did not have a partner, so Knapp discussed the problem with him.
- In interactions with his students, Knapp responded with a calm but enthusiastic demeanor. He is clearly skilled at interacting with his students.

Area for improvement:

- I would strongly recommend interacting with your students earlier in the class period and more frequently. I was only there for one class, so I don't know

for sure if the class I visited was typical. That said, the day I was there, the first 8 minutes were spent going over LaTex commands on the screen, and the students seemed completely unengaged for that period. At least two were doing unrelated things on their phones in the back of the room. As soon as you introduced an interactive example, though, everyone became actively engaged. This was the rare class where the energy-level and engagement-level seemed to increase throughout the lecture period. It would be great to have more of this starting at the beginning, especially since it is clear that you are highly skilled at interacting with your students.

Below are some additional details concerning the university's four new required categories:

Professional Teaching

Knapp's in-class exercise, described above, was clearly designed to maximize students' understanding of the material.

Inclusive Teaching

All the students participated in the interactive exercise. Even if they did not speak aloud to the entire class, each student got a chance to discuss the material with a partner. Greg also prompted students for questions and encouraged them to ask questions.

Engaged Teaching

Knapp clearly cares a lot about teaching and actively seeks out opportunities to improve. In fact, he took the initiative to approach me and ask for my feedback (since from being a student in my classes, he knows I also care a lot about teaching), even though he was not scheduled to be observed this term.

Research-Informed Teaching

Knapp did a great job linking together different topics (e.g. linking the upcoming study of quadratic reciprocity to the current focus on Wilson's theorem) and different parts of the course (e.g. introducing aspects of examples of quadratic reciprocity in earlier homework assignments).

Concluding remarks

Knapp is a skilled and thoughtful instructor. Students clearly respond well to his

prompts to engage and interact with the material and with him. My only suggestion for improvement is to schedule some interaction earlier in the lecture and maybe even more often.

Sincerely,
Ellen Eischen

Ellen Eischen
Associate Professor
Department of Mathematics
University of Oregon
eeischen@uoregon.edu

Linear Methods I, Fall 2024

This observation occurred during my third time teaching this course at the University of Calgary. My evaluator, Dr. Jerrod Smith, sat in on my 8 AM section, and observed that I paid attention to important performative details during my lecture, and helped my students learn actively through think-pair-share exercises. His full comments are here:

5 October 2024

Dr. Greg Knapp

Department of Mathematics and Statistics
University of Calgary
2500 University Drive NW
Calgary, AB, Canada
T2N 1N4

Re: Teaching Observation Dr. Greg Knapp; MATH 211 Linear Methods I on September 16, 2024

Dear Dr. Knapp,

Thank you for inviting me to observe your MATH 211 *Linear Methods I* lesson on September 26, 2024. This letter details my observation of your lesson and our subsequent conversation. Please feel free to include this letter in your teaching dossier.

Your MATH 211 class is part of the Schulich Studio flipped-classroom, active learning model of instruction for first-year students in the Schulich School of Engineering (SSE). Each week, students complete pre-lecture work consisting of 1-hour of pre-recorded video content. Learners then participate in a 1-hour lecture with you. Finally, students complete a 2-hour *studio session* that consists of a variety of active learning exercises. I observed one of the 1-hour lectures with your students.

At the beginning of the class, you reminded students of upcoming assessment deadlines, and you took a few minutes to discuss an issue that students were encountering in their online homework by displaying the homework system via the projector and walking students through a resolution of the technical difficulty. Before beginning the day's content, you solicited student questions about their pre-lecture work within the flipped-classroom instruction. After answering a question, you checked for the student's understanding by asking "Does that answer your question?". This detail speaks to the welcoming and inclusive environment that you work to create. Asking "Does that answer your question?" instead of "Does that make sense?" shifts any perceived pressure of understanding off the student. I was impressed by this small act, and I am working to incorporate it into my own teaching practice.

The remainder of your lesson consisted of structured active learning exercises that built on the student's pre-lecture work. You primarily used *think-pair-share* activities to guide learners through determining the truth of several statements regarding properties of matrix multiplication. Students were instructed to think about the problem individually for a few minutes and then were asked to discuss the problems in small groups. After the group discussion, you led a classroom-wide discussion of the problems and solicited input

from several different groups of learners. You were highly supportive of students' suggestions and took the time to work through students' thinking (even when incorrect) to highlight aspects of their solution that worked well and areas for improvement. You effectively used incorrect student suggestions to prompt further discussions and lead student to a correct solution in a collaborative way.

One area of improvement I suggested during our debrief conversation was to move throughout the classroom while students are working individually and in small groups. This allows you to re-engage students that have lost focus and to gauge students' progress through the exercises. You remarked that this is typically something that you do, but you were working to resolve an issue with a prepared exercise while students were working during the session that I observed.

Of course, one area of challenge in flipped-classroom teaching, and active learning strategies in general, is moving through an adequate amount of material while providing enough time for learners to engage. I encourage to continue to think about this balance and explore ways to have students engage in some "quick" active learning exercises.

You were enthusiastic about the content and their interactions with learners. You repeated students' questions through the classroom microphone so that all students could hear, and paraphrased learners' responses to questions to confirm understanding and ensure that others remained engaged and able to hear. You were encouraging of students' input and questions, and you managed the pace of the class well. You ended the class by posing a modification of the last example that you discussed as a *challenge exercise* for students to engage with before their next lesson.

I also want to remark on your demonstrated commitment to professional development within your teaching practice. To date, you have completed several *badges* from the Taylor Institute for Teaching and Learning, which supports educators across the University of Calgary. Each *badge* consists of 12-hours of active workshop participation. You also participated in our departmental teaching and learning book club during the summer of 2024, during which we read the book "Ungrading" edited by Susan D. Blum.

Overall, your approach to teaching is highly student-centred, and you effectively employ evidence-based active learning techniques in the classroom. You create a welcoming and supportive classroom atmosphere through small but impactful actions that centre student learning and growth. It was a pleasure to observe your lesson.

Sincerely,



Jerrod M. Smith, PhD (he/him)

Associate Professor (Teaching)

Interim Associate Head Teaching & Learning

jerrod.smith@ucalgary.ca

7.2 Student Evaluations

This section contains some commentary on my student evaluations since 2021. I chose to begin in 2021 because it is representative of my recent teaching work, and it covers a range of courses (from calculus through number theory) and a range of modalities (from fully online to fully in person). I've selected a few student comments to highlight from each course, and I have included some context for each course, as well. The full student evaluation forms can be found in the Appendix.

Calculus II, Winter 2021, UO

I was the instructor of record for this remote learning course. This was the third course I taught as instructor of record in a fully online setting, and I was comfortable with the necessary techniques for lecturing and engaging students in this modality.

This was the first time I asked students to do an oral presentation as part of the course. Students could choose between three or four topics where integral calculus appeared in “the real world” (or they could choose their own), they completed an extended homework problem on the topic, and then they presented their findings. Students did not present to the entire class, and instead, they just presented to me.

Selected student comments:

- “Greg’s expectations were clear and he genuinely wants his students to succeed, he is a great instructor and any university would be lucky to hire him!!”
- “I liked the teacher’s feedback because I always had a good idea of how to improve the quality of my work on the written assignments.”
- “I like how the lectures are organized and don’t go too fast. I also like that you have lecture guides because when teachers don’t it’s hard to know what is important.”
- “I don’t really like the oral presentation because I am not a great presenter and it makes me nervous to speak in front of someone, especially about math.”

Calculus III, Spring 2021, UO

I was the instructor of record for this remote learning course. This was my first time teaching sequences and series, and it ended up being trickier than I expected. I was just following along with the textbook for a while, but a midterm exam went poorly, and we spent a day just talking about how things could get better for us as a class. I changed up my approach a bit and rather than spending all of my time introducing new material, I began integrating review components into the course so that students could compare and contrast old material with new material. This culminated in the worksheet in section 6.2, and the end of the course went substantially better than the beginning.

Selected student comments:

- “The support from the teacher was 100/10. Office hours are the best thing ever and super super helpful”

- “There was one time in this class that everyone agreed we could as a whole have done better and we spent the day after this happening just talking about what happened and how we could all do better. I felt this was really good and a really good way of keeping everyone engaged in the course.”
- In response to the question “What specific change in the use of active learning would help your learning?” a student said “This is really only an issue I feel like because things were online. Even with things being online Greg but an obvious effort in to make things ‘active’.”

Calculus II, Fall 2021, UO

I was the instructor of record for this hybrid modality course. This was the first term returning to in-person instruction after the COVID-19 pandemic, and it required some adjustments. During online learning, I had consistently used Zoom’s polling features to check in with students during class. Breakout rooms had met with mixed success. I tried to replicate the Zoom polling success in person by asking student to use an app called Socrative. This ended up being a chore, as a student notes below, because students would have to take out their phones and laptops every time we wanted to do a poll question. It ended up taking so much class time that we switched from the poll questions to in class group work.

Selected student comments:

- “Greg was super supportive in making sure that the whole class understood the subjects we were learning. When someone asked a question he would answer it multiple ways until they understood it, not just give it one answer. He took time to ask the students how we wanted to make changes to the course structure and almost immediately put those changes into the course, quickly reorganizing everything for us.”
- “Greg was very accommodating with me and my ADHD.”
- “I really enjoyed the guided notes. That always makes learning a lot easier when you can easily follow and organize your own notes.”
- “Participation through Socrative felt a bit like a chore rather than an opportunity to apply. The groupwork format was a good change.”

Fundamentals of Number Theory I, Winter 2022, UO

I was the instructor of record for this hybrid modality course. This was my first chance at teaching a proof-based course, and it required me to learn some new ways of teaching. One of those new things I tried was a peer review model for homework, and this ended up being somewhat controversial among the students. Some students liked having feedback, while others found it difficult to give good feedback, and frustrating when they received poor feedback. I ended up adjusting the peer review model before the next term’s Fundamentals of Number Theory II course, and one of the students who was previously critical of the peer review system warmed up to some of the changes that I made.

Selected student comments:

- “The instructor has done a great job at making office hours available for everyone. I feel like I learned the most over all during office hours and outside communication from the instructor.”
- “With the very specific and detailed feedback from homeworks, I’ve learned a lot what I did good and what I did not good. It really helps me to answer a math problem in a professional and mathematical way.”
- In response to the question “What specifically about the use of active learning helped your learning?” a student said “Greg does a great job encouraging students to ask questions and providing weekly opportunities to apply what we’ve learned during class time”
- “Every Friday we were given worksheets to work as a group with other students and this helped me. How? Well I am the kind of person that does not do much for class other than the homework and assignments. Within a group of students I was able to reinforce my understanding of class material and work through different applications that we might not cover on the homework.”
- “I liked the Draft/Review/Final model for homework assignments since I got to see other ways to solve problems and it forced me to start thinking about each assignment early.”
- “Greg offers both in person as well as a synchronous zoom option, which is very accommodating and allows everyone to be able to attend class and receive the same course material.”
- “The course organization is beneficial to my learning because I am able to do a draft of a homework get it peer reviews and then revise to submit the final. But this is like 3 assignments for one HW so it might be beneficial to my overall learning but it can be overwhelming during midterms weeks with other classes.”
- “Assignments usually have little connection with the textbook or with lectures. The lectures tend to be primarily running through proofs with little examples or explanation of their uses, leaving students ill-prepared for any use or knowledge to solve problems. The peer review for the class is more harmful than helpful, leaving students with incorrect comments that could have easily been remedied if the comments that the instructor left on everyone’s peer reviews were instead focused on the person’s work who was being reviewed. The instructor seems to have many too many assignments as he many times would fall weeks behind in grading leaving students with little feedback so they continue to be marked down for making the same mistakes over and over again from lack of timely feedback.”
- “I think Greg has been doing a great job as an instructor. He cares about every student and I feel supported thought the term. The format of this class was designed in a good way so that we have time to practice in class and have enough time to finish homework and really learn stuff from revising homework. Especially the peer review session and

using portfolio to replace 'regular in class paper exam'. The peer review session gives me a chance to learn how other student approach to the answer of same problem. The portfolio part provides a really good way to summarize and conclude what I have learned so far, it's kind of like a review but let you dive further into the knowledge."

Fundamentals of Number Theory II, Spring 2022, UO

I was the instructor of record for this hybrid modality course. This course was about a third of the size of the previous course and every student but one had been in the course the previous term. As a result, there's some selection bias in the sample.

This course featured some project-based learning. Students began working on an expository paper midway through the term, submitted regular updates throughout the term for feedback, and then presented on their topic and wrote a final paper at the end of the term. I was really impressed at how well the students did on these projects, and they seemed quite pleased with the projects as well. This is certainly something I'll be looking to include in future classes.

- "He helps us a lot with projects and assignments. He always uses different ways to follow and answer our questions."
- "I had a very positive experience with the final project which included some independent study."
- "Having group work was helpful to discuss and think through the concepts that we learned each week."
- "Although challenging, I really like the course portfolio and final presentation/paper. I felt like doing these instead of exams helped me learn more useful, longterm, mathematics skills."
- "I would recommend taking another look at the section of the curriculum on partitions. I think that week's homework was much harder than the other ones. Going from the usual course material to more combinatorial thinking was jarring."
- "Course organization needs improvement, specifically in regards to assignments, group work, and peer review. I suggest reading assignments to help prepare for each week, more time to discuss problems in class and work with peers, and better rubrics and structure for peer reviews. (Perhaps doing them during class so students can receive feedback from instructor so students can receive beneficial feedback.)"
- "I think I've warmed up to the peer review idea. This second term I've had some good reviews that pointed out when I've cut too many corners in my proofs. I've also had some reviews of lower quality but I think this is unavoidable."

Calculus for Business and Social Science I, Winter and Spring 2023, UO

I was a teaching assistant for these courses, and I was primarily focused on completing and defending my dissertation during these terms. Nothing particularly substantial happened, and response rates on my course surveys were low.

Linear Methods I, Fall 2023, UC

I was the instructor of record for this hybrid modality course, and this was my first course at the University of Calgary. However, this is much different than the other courses for which I was instructor of record. In other courses at UO, I was creating all of my own course materials, including homework assignments and exams, independently of the other course sections. For this course, however, I was much more like a TA. Students would attend online lectures given by the course coordinator, and they would come to my class for active learning exercises, which I had created for the purpose of internalizing the content they had recently seen in lectures. Then, students had sessions with the teaching assistants in the second half of the week. All course policies, assessments, and so on were standardized across the different sections of this course.

Since this course had an experimental format, it was met with some resistance, as is indicated by the student comments. In particular, it was not clear to the students that the TA sessions at the end of the week were supposed to be run by the TAs, and some of the students were critical of the fact that I did not attend those sessions.

That said, I think I could have done a better job of bridging the gap between the online lectures and the TA sessions. I mostly gave students time to work on worksheets in class, but I think it would have been better to structure that time so that students would all work on one problem, and then we would go over it as a class. Then, students would work on the next problem and we would go over that one. (This is how I am currently formatting my classes in the revised version of this course, and things are going much more smoothly this term.)

Some selected comments:

- “What really helped me was that my instructor was always available and willing to help, and answer everyone’s questions. I also found helpful the way my instructor implemented the lectures.”
- “Although everything went really smooth in the course, I would say that the worksheets should be solved in class so that students participate more rather than just doing other homeworks while being in the class.”

Linear Methods I, Winter 2024, UC

I was the instructor of record for this in-person course. This course format is somewhat between the format of the Fall 2023 version of this course, and the courses I was familiar teaching at UO. In this course, I was my students’ primary lecturer, but I again was prescribed the course policies, the course homework assignments, and the course exams.

This course ended up going very well, and I had excellent rapport with my students. They were very willing to ask questions in class, and I reciprocated by answering enthusiastically and encouraging more. This was the first course where I really began relying on think-pair-share exercises for the active learning component of my course, and this worked well in a large lecture. These exercises went well enough that I continued to use them in the fall of 2024, and I felt like they met with a similar level of success.

Some selected comments:

- “He went at an excellent pace, was very kind and always made it seem okay to ask questions no matter the understanding level, and had exceptionally well organized notes.”
- “Beautiful ability to bring clarity and humour to the absolute absurdity that is an hour and a half straight of linear algebra. This class could have been boring, dense, and confusing with another professor but with him it was just great.”
- “Include more theory based practice questions in lectures to help students understand the concepts on a deeper level. He did do that a bit recently but would’ve helped if it was being done since the start.”

Linear Methods I, Fall 2024, UC

I was the instructor of record for this in person course. Again, the structure of the course changed and was different than either of the two previous terms in which I had taught this course.

In this term, students watched one hour of lecture videos each week on their own time (designed to teach them the course theory), then came to a one hour lecture with me (designed to go over examples which would illuminate the theory from the videos), then attended a two hour active learning session with me and several TAs.

As in previous iterations of the course, all assessments were centralized: students had the same homework assignments and exams across all sections of this course.

Since the course structure was much clearer than in the fall of 2023, and more effective than in the winter of 2024, student comments focused less on course structure and more on implementation.

Some selected comments:

- “Asking Professor Knapp any questions, whether it be during lectures, studio sessions, or even in the hall was a wonderful experience. Professor Knapp clarified the concept well, applied it to the question in a simple manner, and reclarified in the end, before asking if there was any confusion to ensure that students understood the concepts properly.”
- “Instructor Knapp was able to clearly show us difficult examples and created an environment in which I wanted to learn and felt I could ask questions to improve my understanding. He implemented feedback from the block representatives and it felt like he really cared about our learning. Mr. Knapp made Math 211 my favourite course so far.”
- “The monday/tuesday lecture, felt almost useless after the online videos, it was just a couple of examples, which could be occasionally helpful, but I think that it would be better to either have 2 lectures instead of one and no videos, or just videos.”

8 Summary and Goals

My teaching journey is only just beginning, but I believe it is off to a good start. I was fortunate enough to have several good role models whose practices inform my own to this day. I have core beliefs about the value of constructing knowledge for yourself and the importance of frequent engagement, but I am constantly tinkering and finding new ways to implement these core beliefs. My strengths include my thoughtful worksheet designs, my ability to teach communication and other transferable skills, and my willingness to improve my methods to provide a learning environment in which my students can be productive.

I still have plenty of areas where I can improve, however. One of those is in my implementation of active learning. I would like to work on balancing the amount of class time dedicated to active learning exercises. I have a tendency to spend too much time lecturing in order to “cover content” and I could spend my class time more effectively by giving the students more time to engage with the course content. Another aspect of my teaching with which I would like to experiment is course grading schemes. The standard grading scheme, where students are awarded points for doing parts of problems correctly, has some serious flaws. It incentivizes mimicry rather than authentic learning, and it encourages a “shotgun” approach to doing problems, where students write down as many things as they can think of in the hope that something is right. I would like to try running a course with a mastery based grading scheme, where students pass the course by mastering certain course objectives. I think that if carefully done, a course based on mastery grading would be better for student learning.

Thank you for taking the time to read my reflections on my teaching up to this point. If you have any questions or if you would like more details on anything contained in this document, don’t hesitate to reach out and contact me at greg.knapp@ucalgary.ca.



Greg Knapp

has successfully completed the requirements for

Theories and Practices: Postdoctoral Scholars

Taylor Institute for Teaching and Learning

December 12, 2024



Criteria:

<https://badges.ucalgary.ca/badges/73>

Verification:

<https://badges.ucalgary.ca/achievements/378543b44a14a41cb74c819e856fcab>





Greg Knapp

has successfully completed the requirements for

SoTL Foundations: Postdoctoral Scholars

Taylor Institute for Teaching and Learning

December 12, 2024



Criteria:
<https://badges.ucalgary.ca/badges/71>

Verification:
<https://badges.ucalgary.ca/achievements/17e7c3a3e6b355363724c1cd43cd93cd>





Greg Knapp

has successfully completed the requirements for

Developing Your Teaching Dossier: Postdoctoral Scholars

Taylor Institute for Teaching and Learning

December 12, 2024



UNIVERSITY OF
CALGARY

Criteria:

<https://badges.ucalgary.ca/badges/65>

Verification:

<https://badges.ucalgary.ca/achievements/16a76c52e0be2fd92bdb756db6426686>





Greg Knapp

has successfully completed the requirements for

EDI Badge for Postdocs

Taylor Institute for Teaching and Learning

December 12, 2024



UNIVERSITY OF
CALGARY

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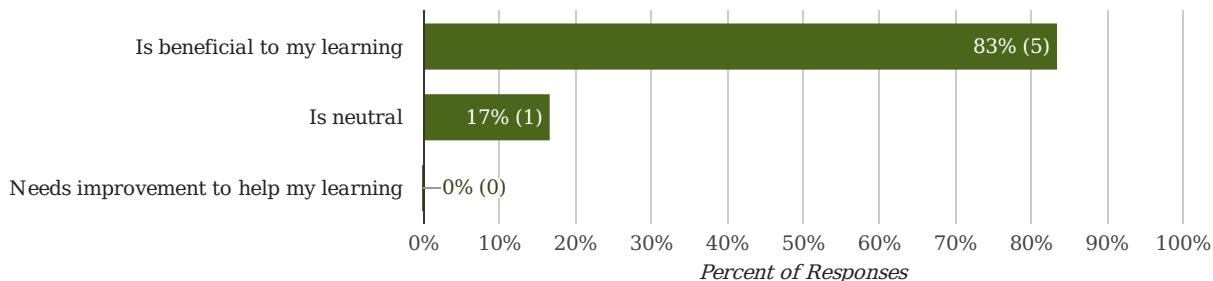
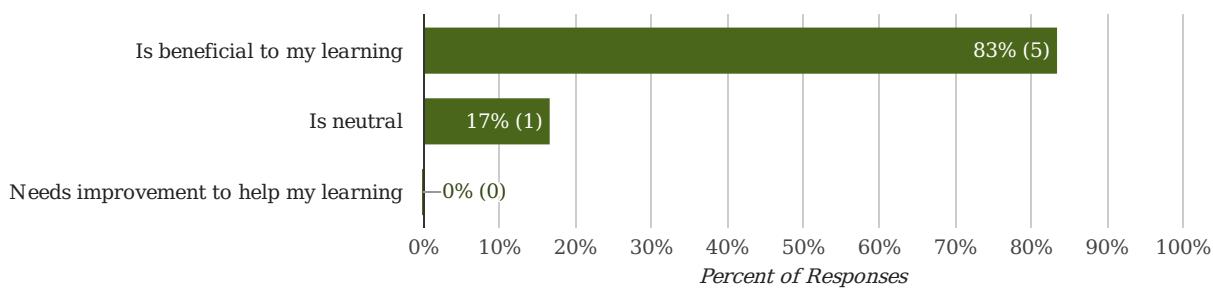
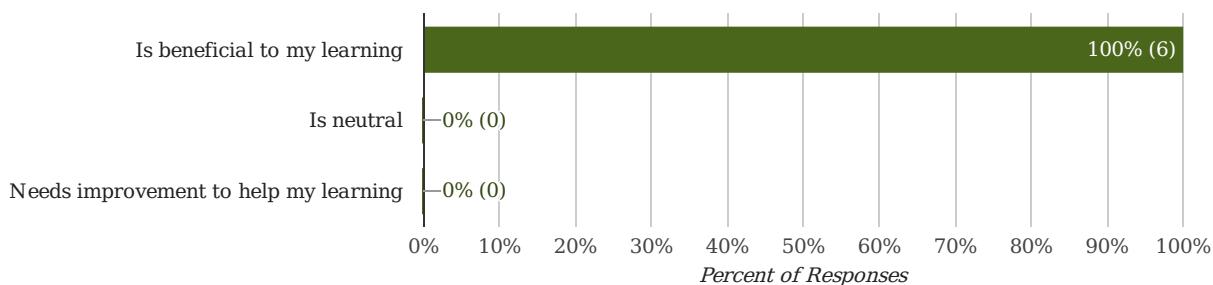
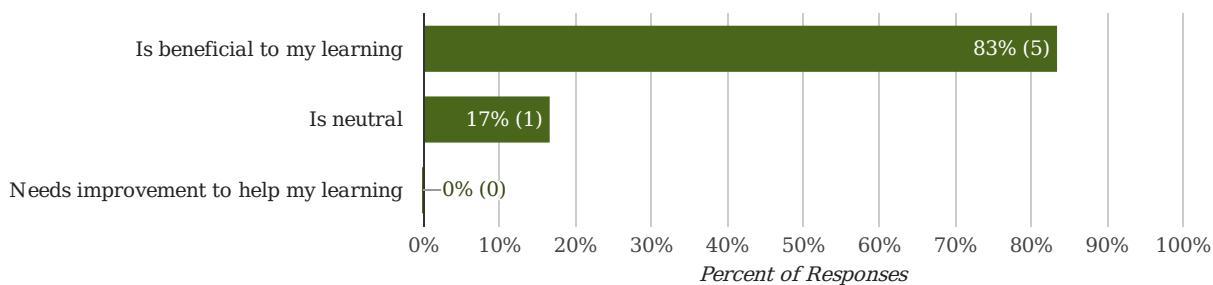
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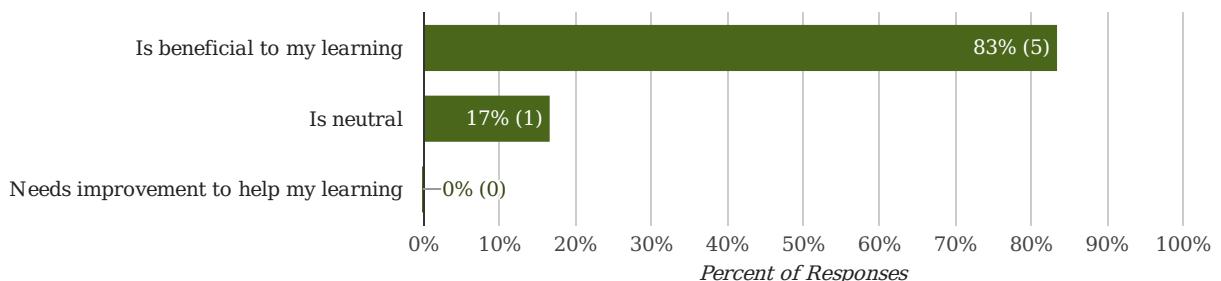
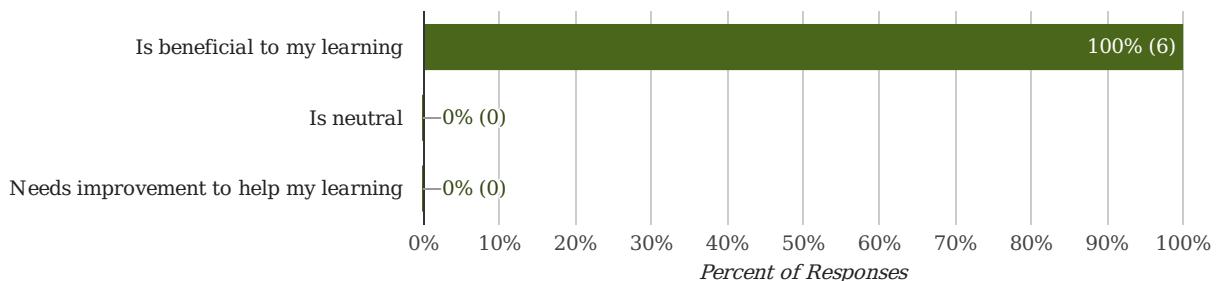
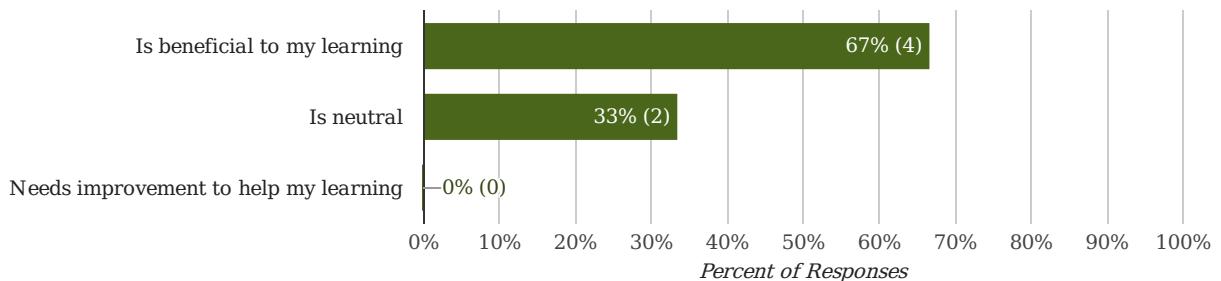
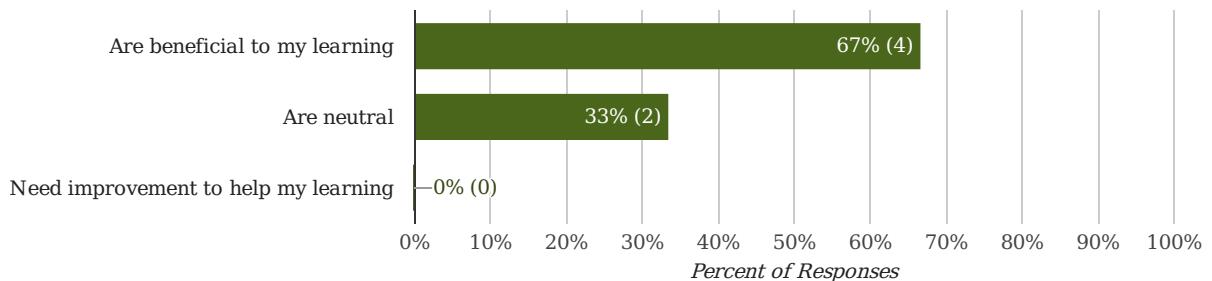
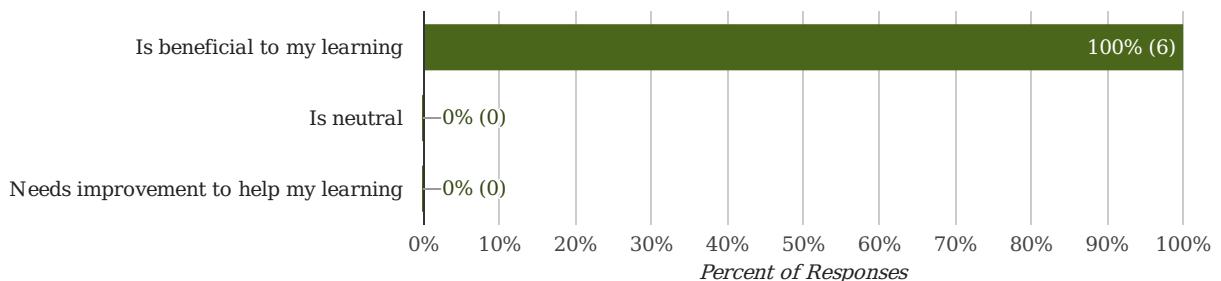
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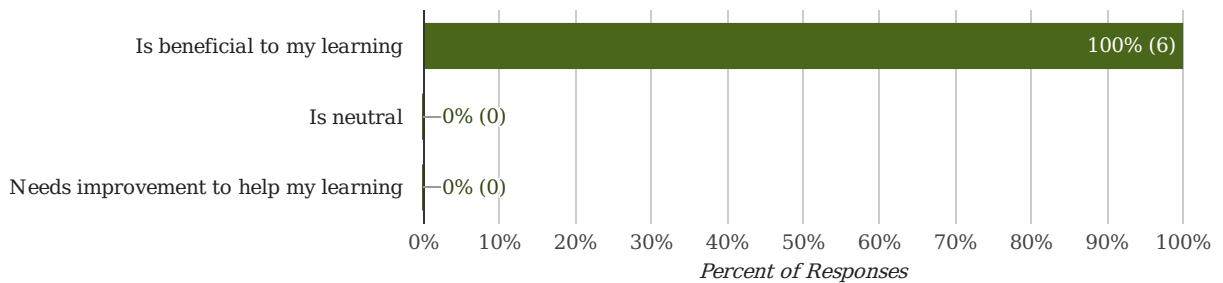
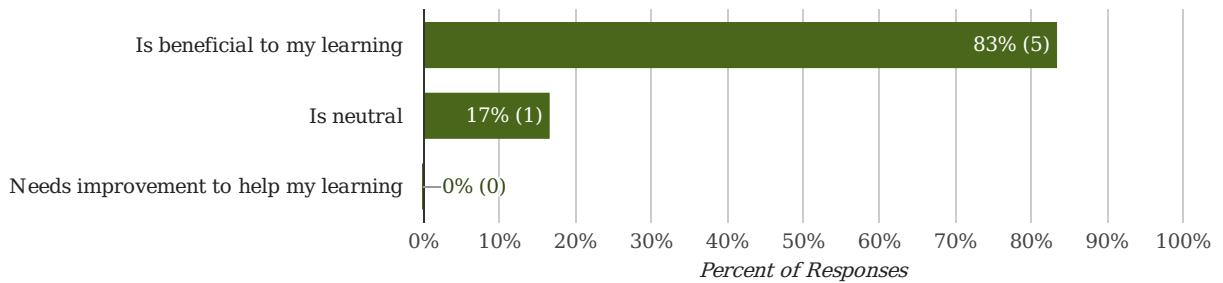
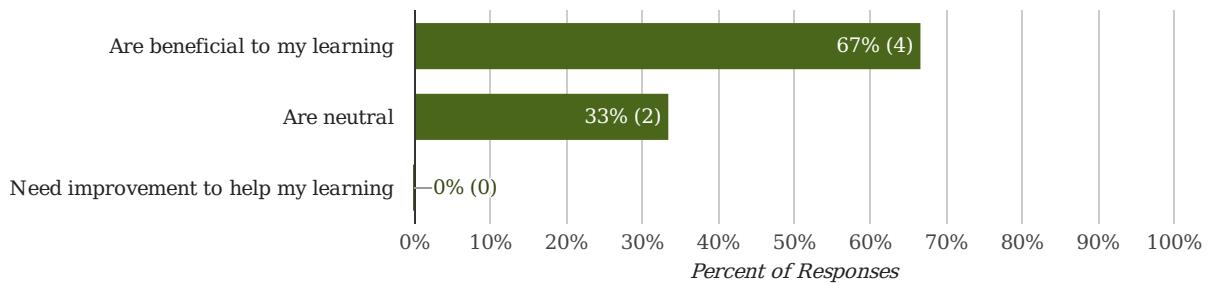
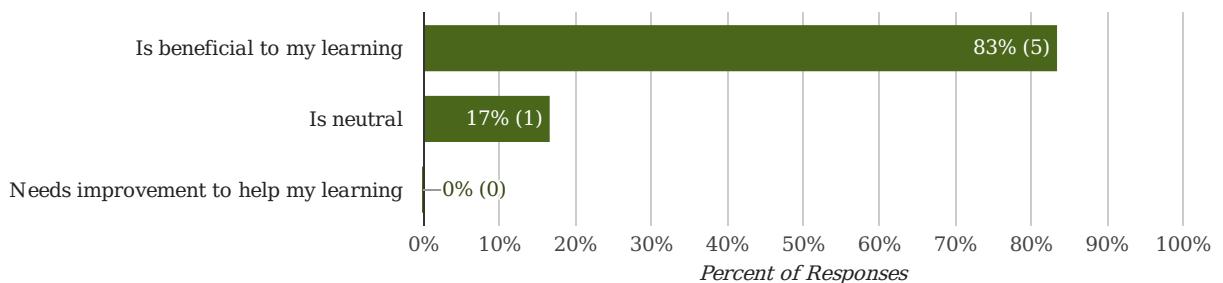
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Teaching and Learning Elements

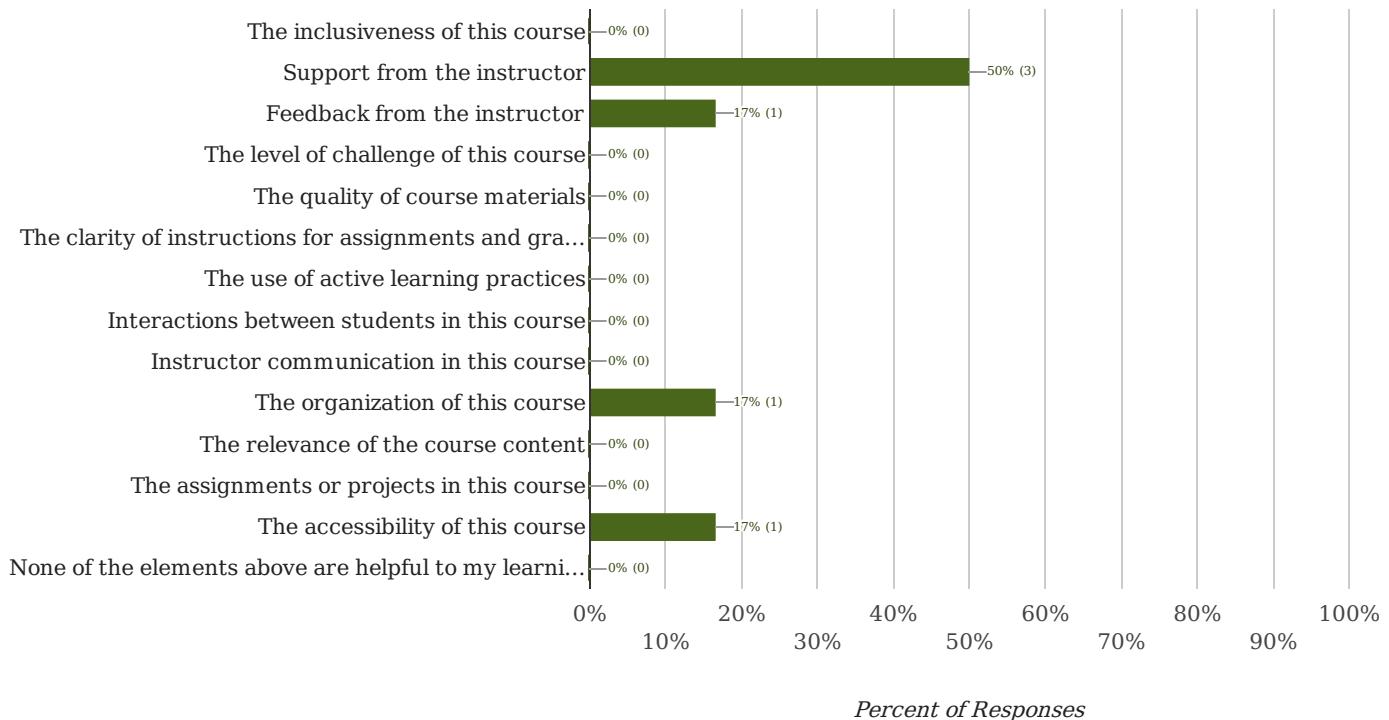
The inclusiveness of this course:**The support from the instructor:****The feedback provided:****The level of challenge in the course:**

The quality of the course materials:**The clarity of assignment instructions and grading:****The degree to which the course includes active learning:****The opportunities for student interaction in this class:****Instructor communication:**

The organization of the course:**The relevance of the course content:****The assignments or projects in this course:****The accessibility of the course:**

Most Beneficial

Please select the teaching element that has been MOST helpful to your learning, and then provide a detailed written comment about what worked well and why.



Most Beneficial Comments

What's Been MOST Helpful to Your Learning? (6 comments)

Q: What specifically about the inclusiveness of the course helped your learning?

Q: What specifically about the support from the instructor helped your learning?

- 1 The instructor was really supportive and flexible.
- 2 Greg's expectations were clear and he genuinely wants his students to succeed, he is a great instructor and any university would be lucky to hire him!!
- 3 fantastic teacher experience. 2nd time I had this teacher this year. always there for help and goes in detail to make sure every single student understands the material

Q: What specifically about the level of challenge helped your learning?

Q: What specifically about the feedback helped your learning?

- 1 I liked the teacher's feedback because I always had a good idea of how to improve the quality of my work on the written assignments.

Q: What specifically about the quality of course materials helped your learning?

Q: What specifically about the clarity of instructions helped your learning?

Q: What specifically about the use of active learning helped your learning?

Q: What specifically about the interactions between students helped your learning?

Q: What specifically about instructor communication helped your learning?

1 I like how the lectures are organized and don't go too fast. I also like that you have lecture guides because when teachers don't it's hard to know what is important.

Q: What specifically about the relevance of the course content helped your learning?

Q: What specifically about the assignments or projects helped your learning?

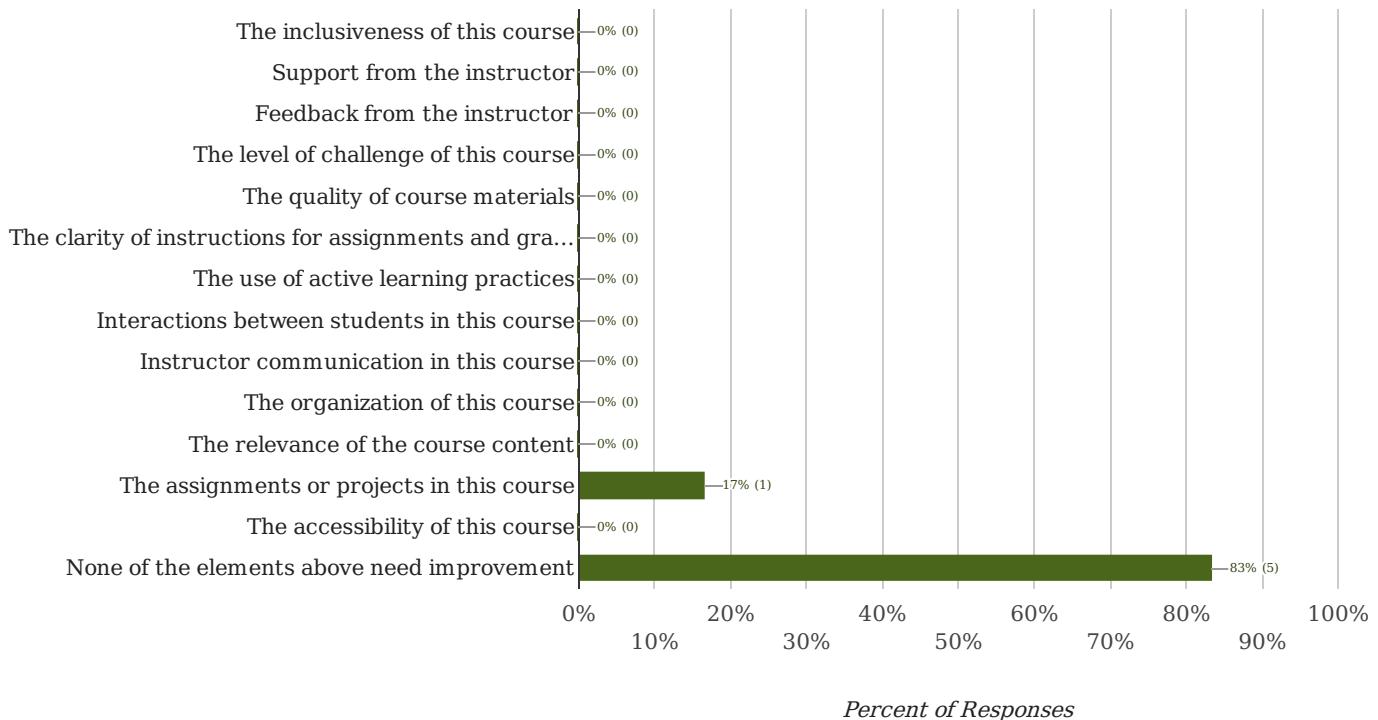
Q: What specifically about the accessibility of this course helped your learning?

1 Many resources to grasp the concepts.

Q: Please say more about how none of the teaching elements above were helpful to your learning.

Most In Need of Improvement

Please select one teaching element that could most use some improvement to help you learn, and then provide a detailed written comment about what specific changes you suggest.



Most In Need of Improvement Comments

What Could MOST Use Some Improvement to Help you Learn? (6 comments)

Q: What specific change in the inclusiveness of the course would help your learning?

Q: What specific change in the support from the instructor would help your learning?

Q: Was the course too hard or too easy? What specific change related to the level of challenge would help your learning?

Q: What specific change in the feedback would help your learning?

Q: What specific change in the quality of course materials would help your learning?

Q: What specific change in the clarity of instructions would help your learning?

Q: What specific change in the use of active learning would help your learning?

Q: What specific change in instructor communication would help your learning?

Q: What specific change in the interactions between students would help your learning?

Q: What specific change in the organization of the course would help your learning?

Q: What specific change in the relevance of the course content would help your learning?

Q: What specific change in the assignments or projects would help your learning?

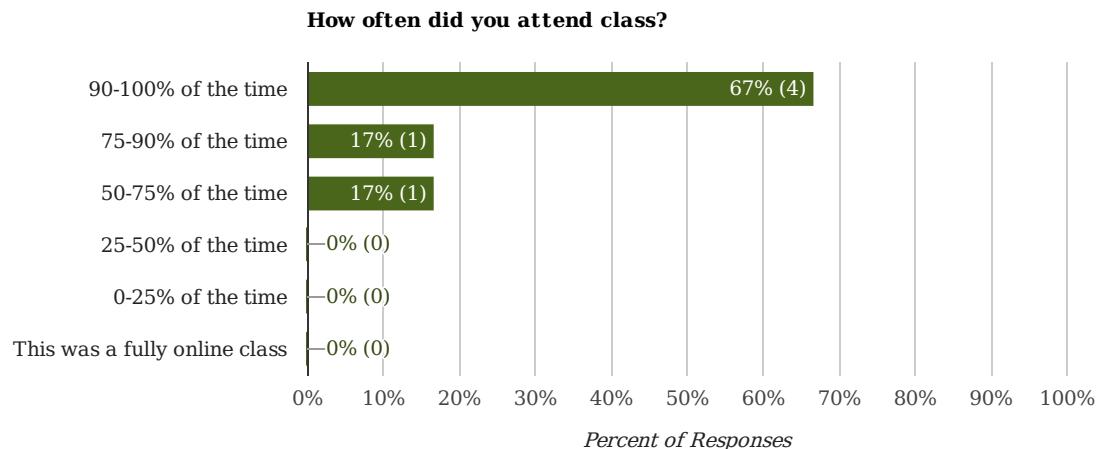
- 1 I don't really like the oral presentation because I am not a great presenter and it makes me nervous to speak in front of someone, especially about math.

Q: What specific change in the accessibility of the course would help your learning?

Q: Please say more about how none of the teaching elements above need improvement to help your learning.

- 1 The course was organized in a great way!
- 2 I think that this class was fine for me; I cannot think of anything specific that needs improvement.
- 3 None!!
- 4 n/a
- 5 This was a well organized course.

Student engagement in their own learning



How Did You Support Your Own Learning? (5 comments)

Q: Why did you attend class 90-100% of the time?

- 1 I attended class 100% of the time because it was required.
- 2 His lectures were interesting and he came with great energy.
- 3 More interactive
- 4 This is a difficult class and attending class is important.

Q: Why did you attend class 75-90% of the time?

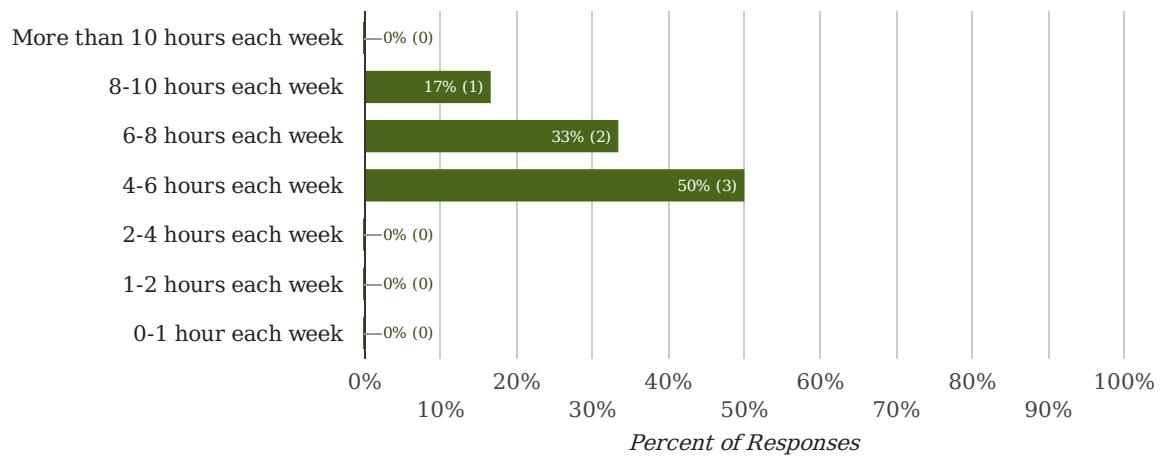
Q: Why did you attend class 50-75% of the time?

- 1 I have kinda had a rough semester so it was hard to get to the live class all the time.

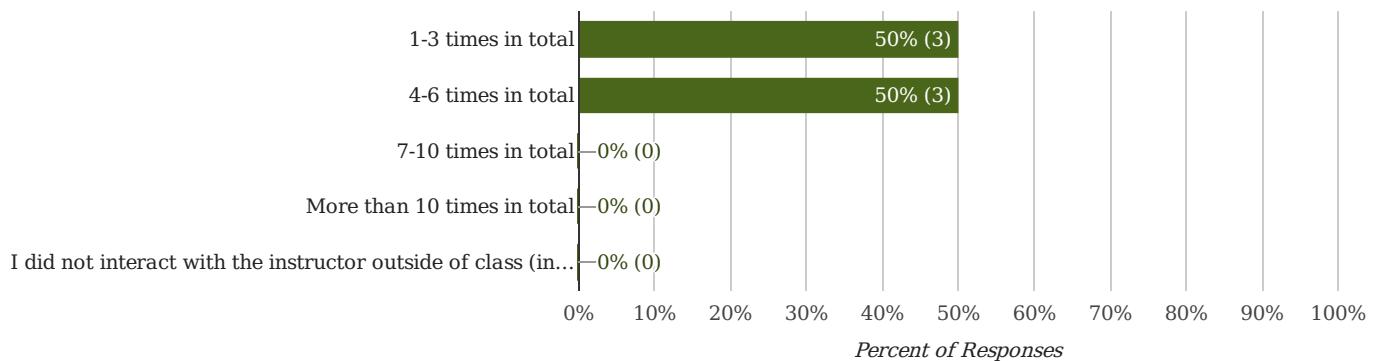
Q: Why did you attend class 25-50% of the time?

Q: Why did you attend class 0-25% of the time?

How many hours per week did you spend on this course (not including any face-to-face class time)?



Approximately how many times did you interact with the instructor outside of class (e.g. by email, office hours)?



COVID Impact

Impacts on my Learning (5 comments)

Q: Describe any challenges you may have faced this session: for example have you experienced technology/connectivity issues, home/personal issues, limited motivation, time management challenges, or distractions that have negatively impacted your learning?

- 1 I am a hard worker and I am able to get tasks done, but I occasionally struggle with time management and limited motivation, especially with long assignments. This did not negatively impact me too much, however, as I was still able to turn all assignments in on time.
- 2 None!
- 3 n/a
- 4 My mental health
- 5 N/A

Is there anything else you would like to say about your learning experience?

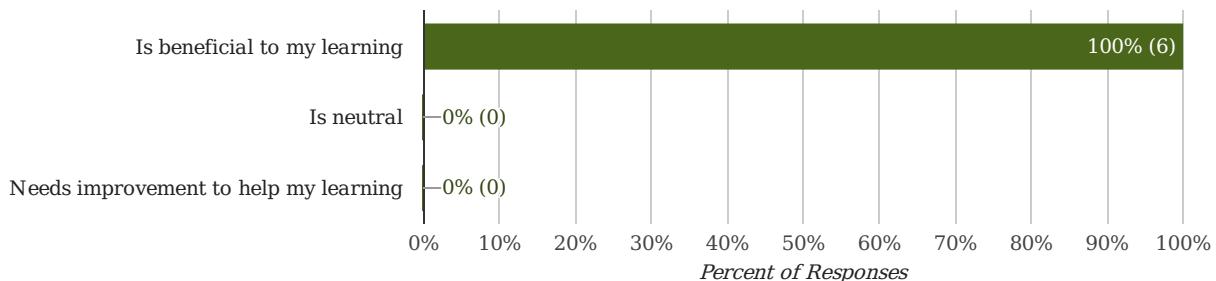
Calculus III (Spring 2021 E-SES)

Instructor: **Knapp, Greg**
 Subject: **Mathematics**
 Catalog & Section: **253 33469**

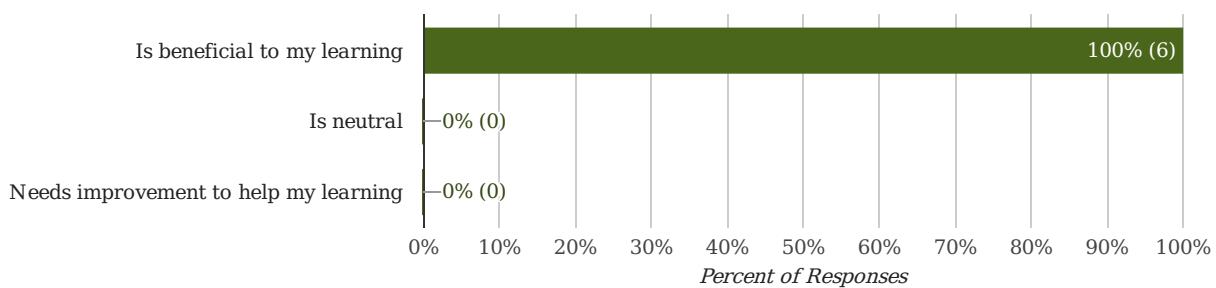
Enrollment: **21**
 Responses Incl Declines: **6**
 Declines: **0**

Teaching and Learning Elements

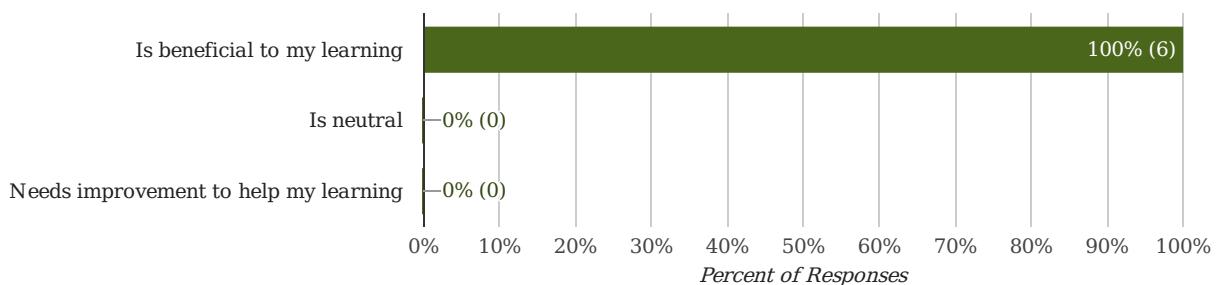
The inclusiveness of this course:



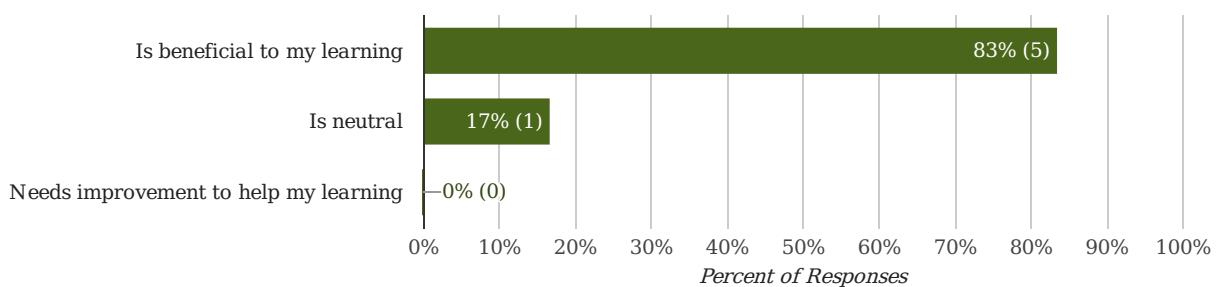
The support from the instructor:

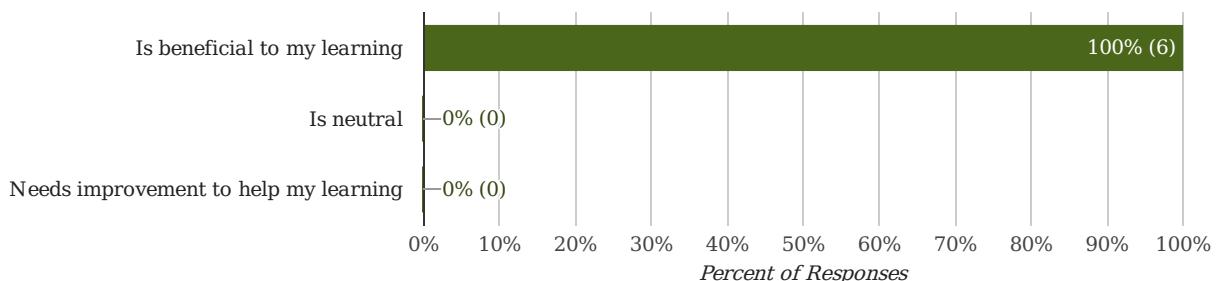
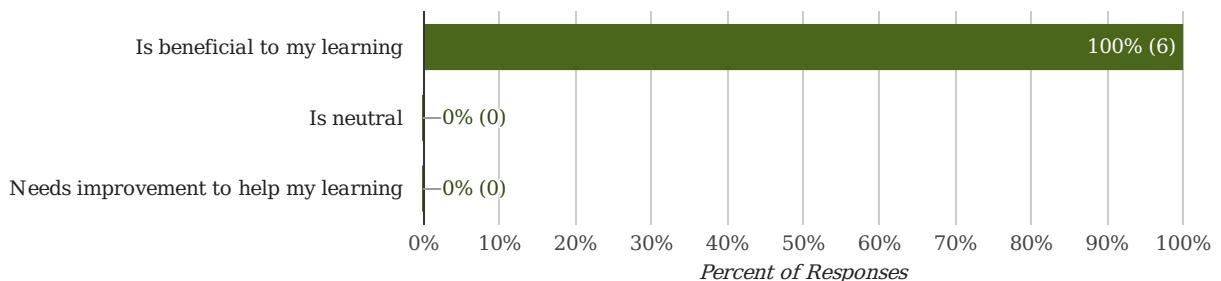
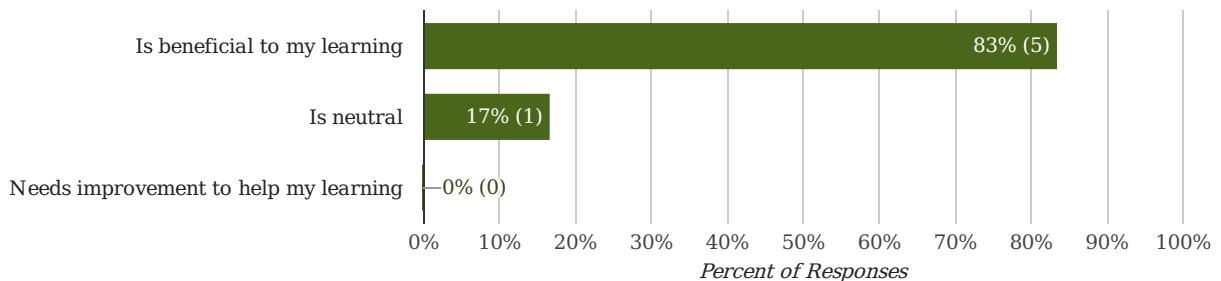
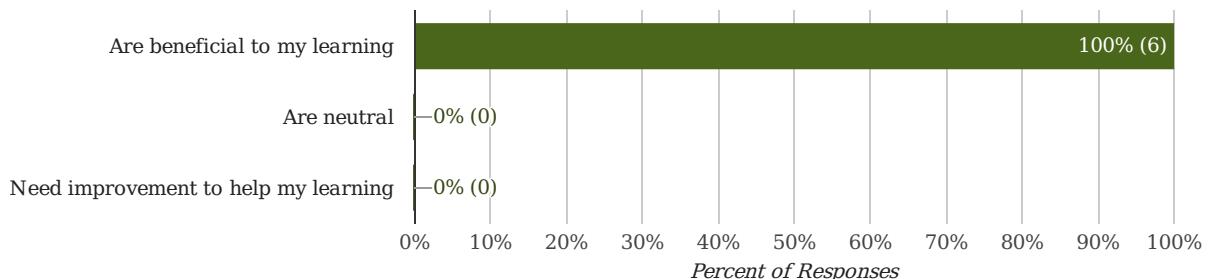
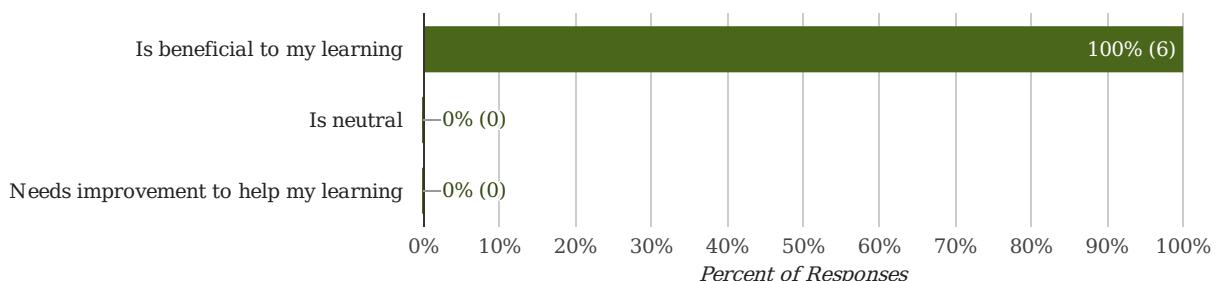


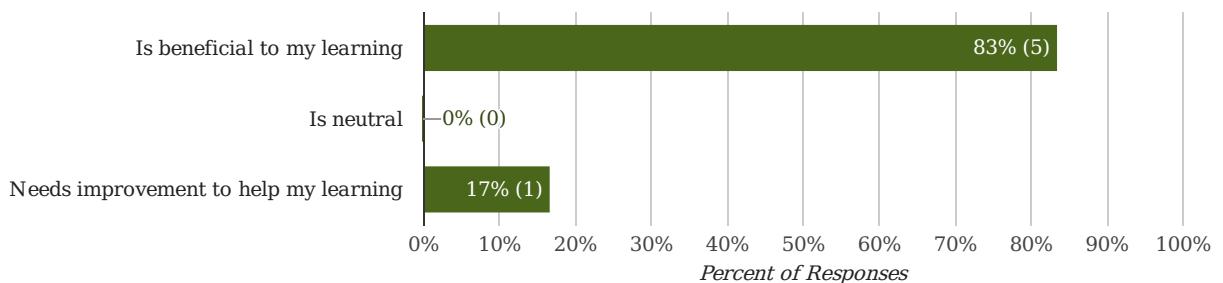
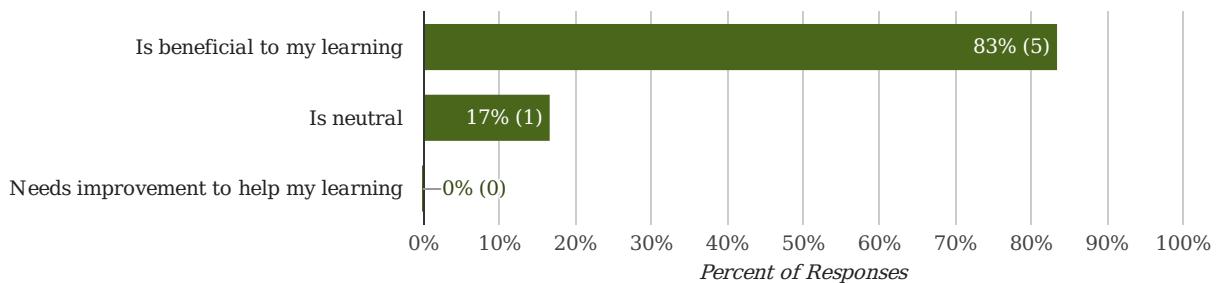
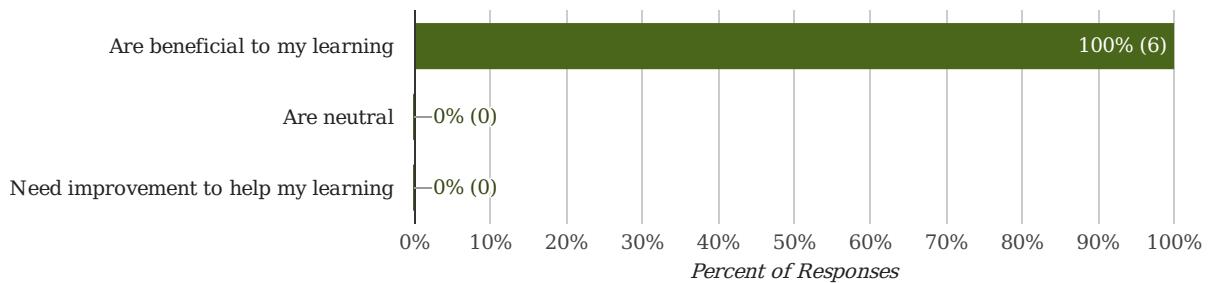
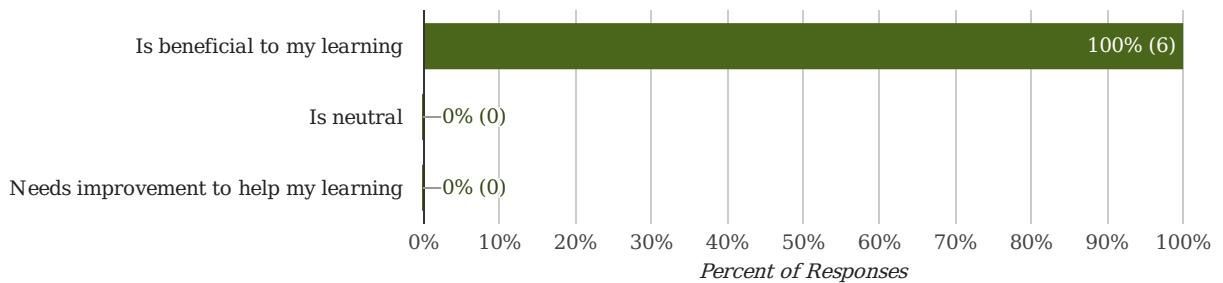
The feedback provided:



The level of challenge in the course:

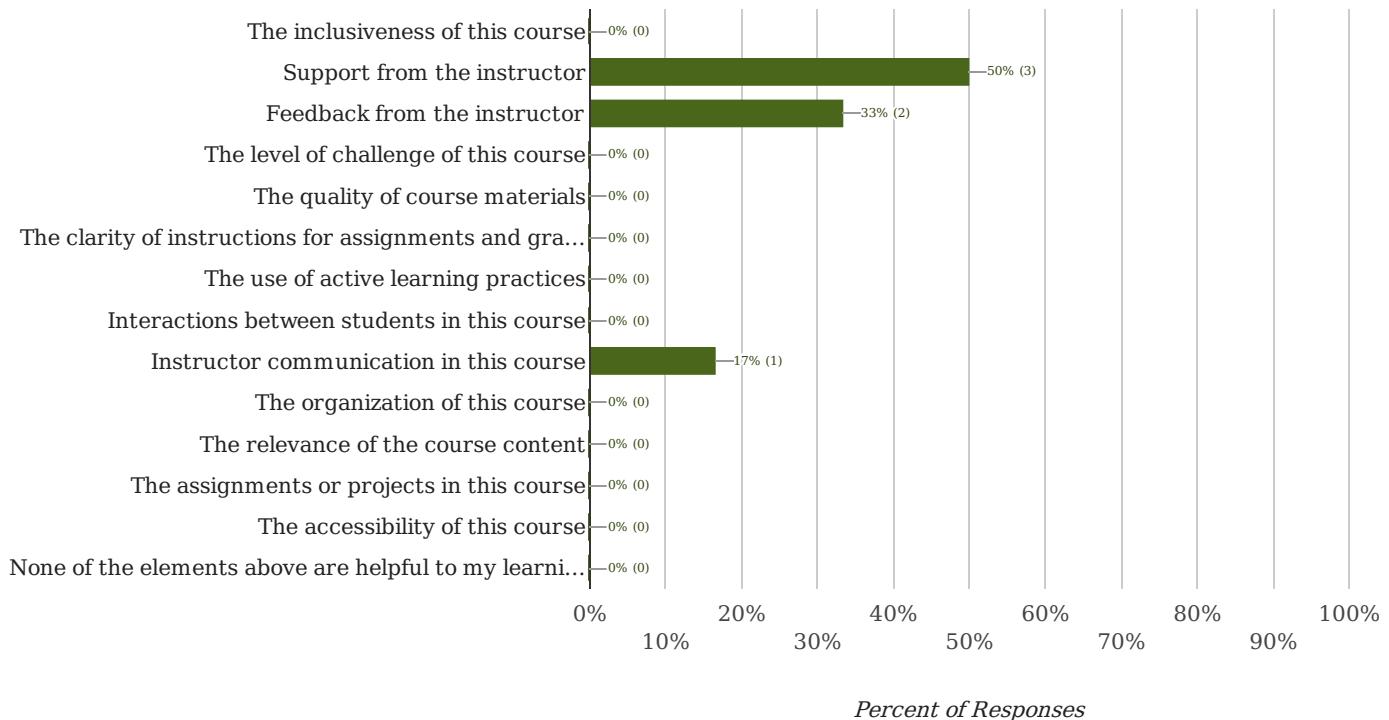


The quality of the course materials:**The clarity of assignment instructions and grading:****The degree to which the course includes active learning:****The opportunities for student interaction in this class:****Instructor communication:**

The organization of the course:**The relevance of the course content:****The assignments or projects in this course:****The accessibility of the course:**

Most Beneficial

Please select the teaching element that has been MOST helpful to your learning, and then provide a detailed written comment about what worked well and why.



Most Beneficial Comments

What's Been MOST Helpful to Your Learning? (6 comments)

Q: What specifically about the inclusiveness of the course helped your learning?

Q: What specifically about the support from the instructor helped your learning?

- 1 Office Hours are very helpful. Greg is always available to help.
- 2 Greg always helped out during office hours and took the time to help me understand when I was confused.
- 3 The support from the teacher was 100/10. Office hours are the best thing ever and super super helpful

Q: What specifically about the level of challenge helped your learning?

- Q: What specifically about the feedback helped your learning?**
- 1 Good communication. Always responded to my emails and was always willing to help me with any struggles I was having in the class.
 - 2 Excellent feedback on assignments, quizzes, and tests.

Q: What specifically about the quality of course materials helped your learning?

Q: What specifically about the clarity of instructions helped your learning?

Q: What specifically about the use of active learning helped your learning?

Q: What specifically about the interactions between students helped your learning?

Q: What specifically about instructor communication helped your learning?

- 1 There was one time in this class that everyone agreed we could as a whole have done better and we spent the day after this happening just talking about what happened and how we could all do better. I felt this was really good and a really good way of keeping everyone engaged in the course.

Q: What specifically about the organization of this course helped your learning?

Q: What specifically about the relevance of the course content helped your learning?

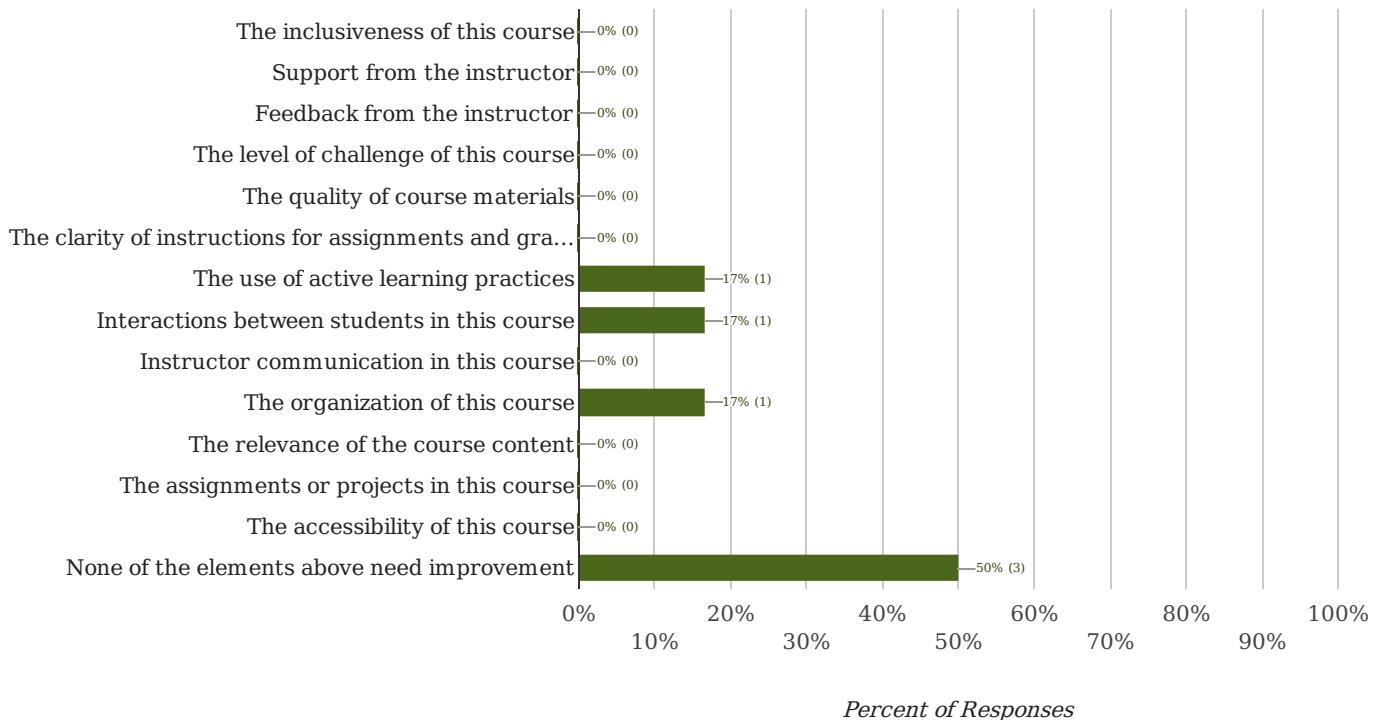
Q: What specifically about the assignments or projects helped your learning?

Q: What specifically about the accessibility of this course helped your learning?

Q: Please say more about how none of the teaching elements above were helpful to your learning.

Most In Need of Improvement

Please select one teaching element that could most use some improvement to help you learn, and then provide a detailed written comment about what specific changes you suggest.



Most In Need of Improvement Comments

What Could MOST Use Some Improvement to Help you Learn? (5 comments)

Q: What specific change in the inclusiveness of the course would help your learning?

Q: What specific change in the support from the instructor would help your learning?

Q: Was the course too hard or too easy? What specific change related to the level of challenge would help your learning?

Q: What specific change in the feedback would help your learning?

Q: What specific change in the quality of course materials would help your learning?

Q: What specific change in the clarity of instructions would help your learning?

Q: What specific change in the use of active learning would help your learning?

- 1 This is really only an issue I feel like because things were online. Even with things being online Greg but an obvious effort in to make things "active".

Q: What specific change in instructor communication would help your learning?

Q: What specific change in the interactions between students would help your learning?

- 1 Hard to find students to collaborate with

Q: What specific change in the organization of the course would help your learning?

- 1 We wasted a lot of time on things that were not relevant to the class. It would be fine if we made it through the content.

Q: What specific change in the relevance of the course content would help your learning?

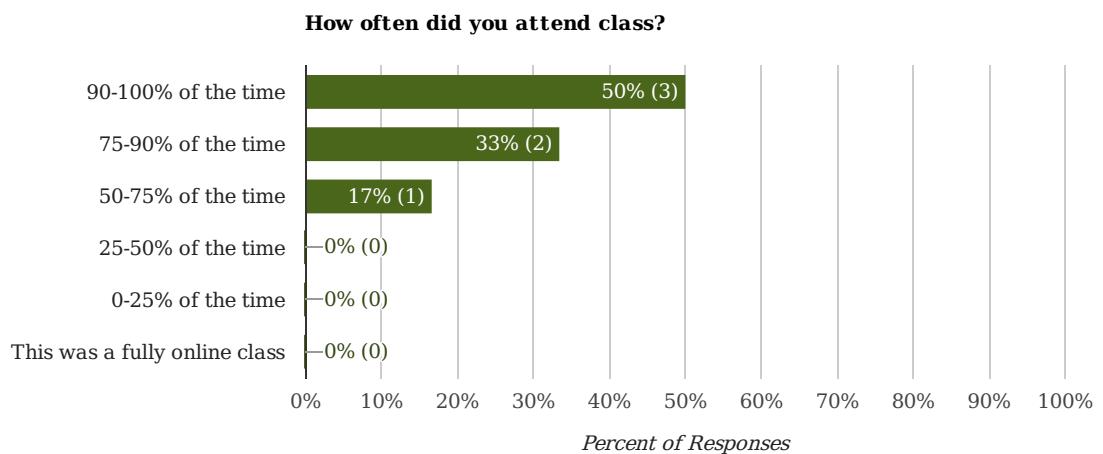
Q: What specific change in the assignments or projects would help your learning?

Q: What specific change in the accessibility of the course would help your learning?

Q: Please say more about how none of the teaching elements above need improvement to help your learning.

- 1 I'd say for a student teacher he did a terrific job. Much better than even some of my more elderly and experienced teachers.
2 Good overall.

Student engagement in their own learning



How Did You Support Your Own Learning? (4 comments)

Q: Why did you attend class 90-100% of the time?

1 I want to learn and ask questions.

2 I don't pay to not go.

Q: Why did you attend class 75-90% of the time?

1 Lectures were recorded and other ways to get participation

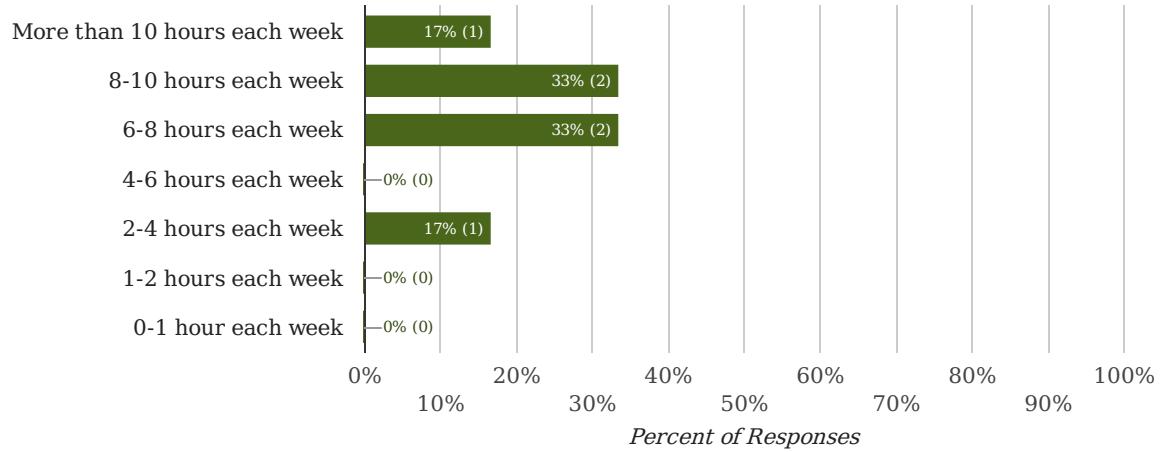
Q: Why did you attend class 50-75% of the time?

1 Because I was too depressed and lonely to attend the first half or so.

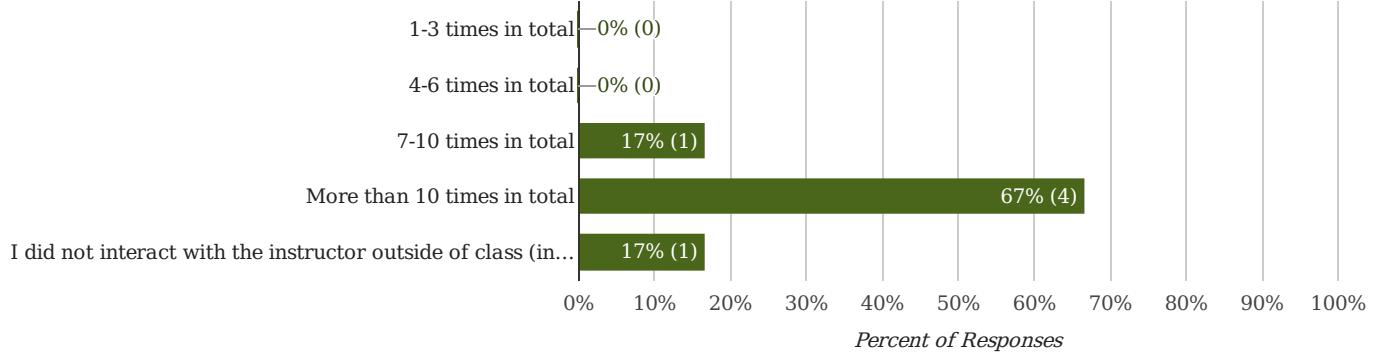
Q: Why did you attend class 25-50% of the time?

Q: Why did you attend class 0-25% of the time?

How many hours per week did you spend on this course (not including any face-to-face class time)?



Approximately how many times did you interact with the instructor outside of class (e.g. by email, office hours)?



Impacts on my Learning (4 comments)

Q: Describe any challenges you may have faced this session: for example have you experienced technology/connectivity issues, home/personal issues, limited motivation, time management challenges, or distractions that have negatively impacted your learning?

- 1 I'd withdrawn the past 2 terms because I was not able to find the strength or accountability required to complete my courses in the COVID climate. Being on campus was a healing experience for me and I wanted to prove myself to my teachers. Now my future is hanging in the balance and I think a refund for stress related damages might be in order.
- 2 limited motivation
- 3 None
- 4 I had a bunch of personal issues this term. More than I've ever had in my life before.

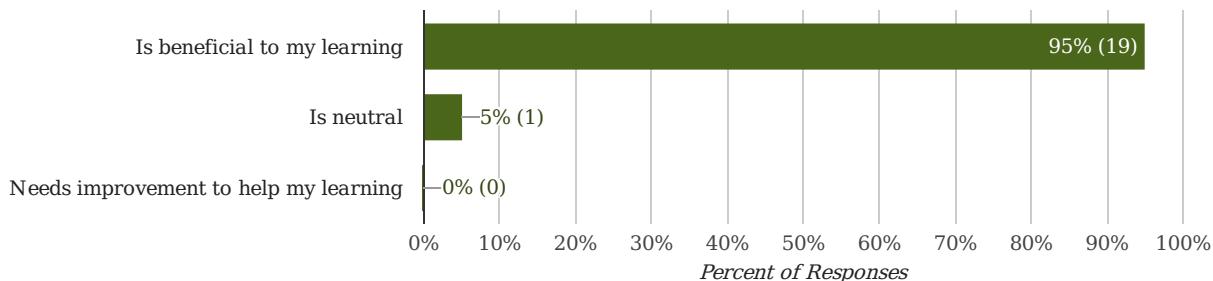
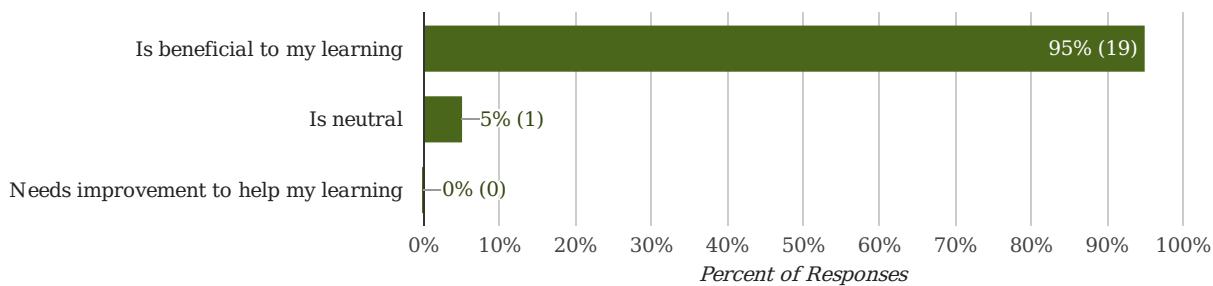
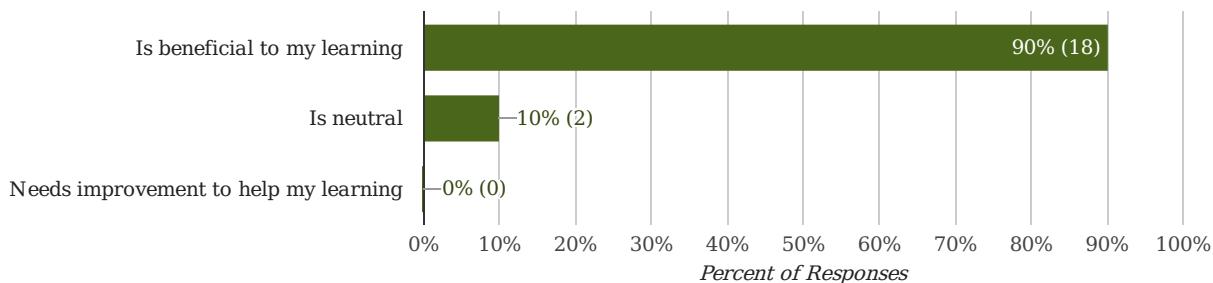
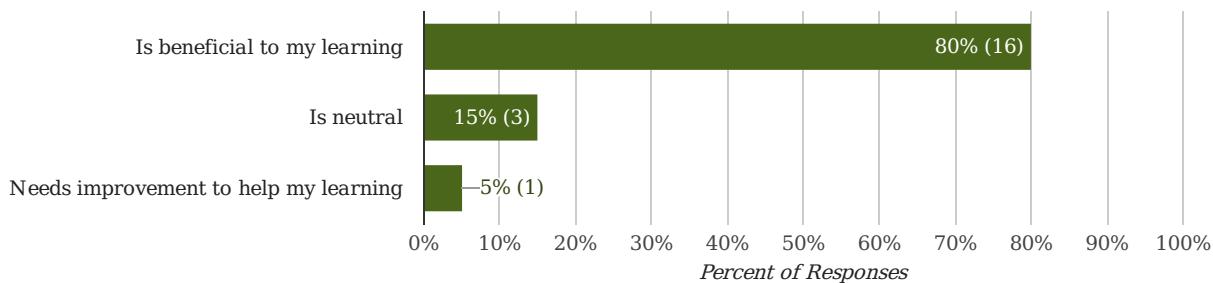
Is there anything else you would like to say about your learning experience?

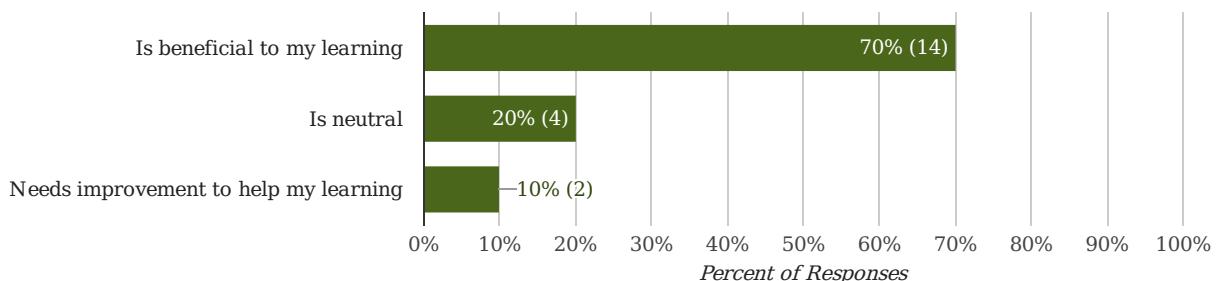
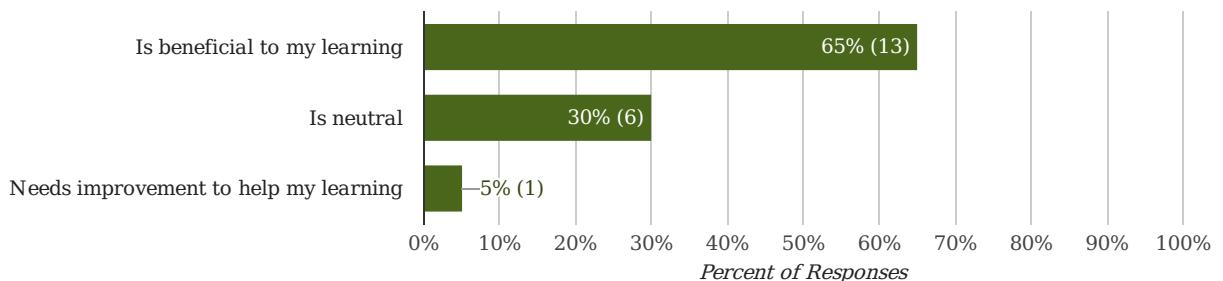
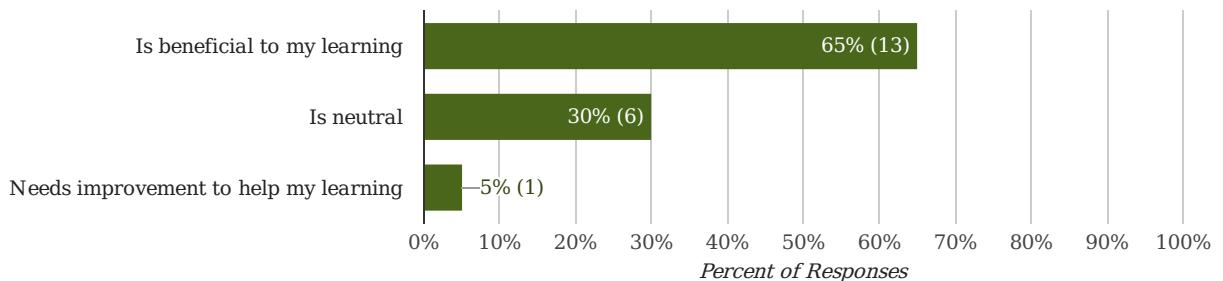
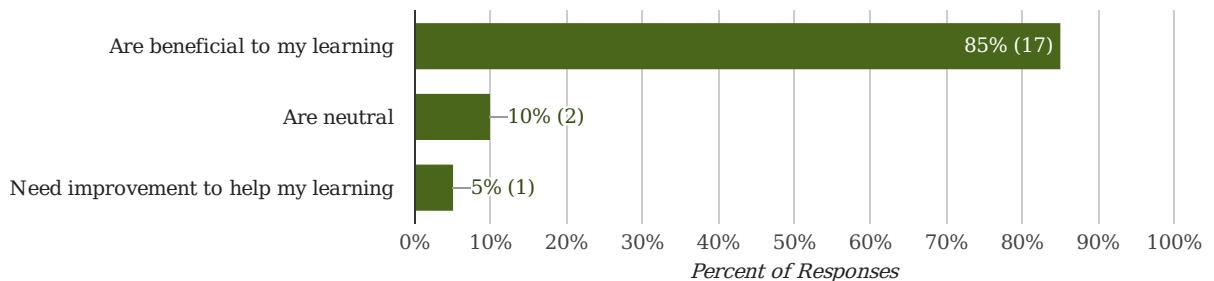
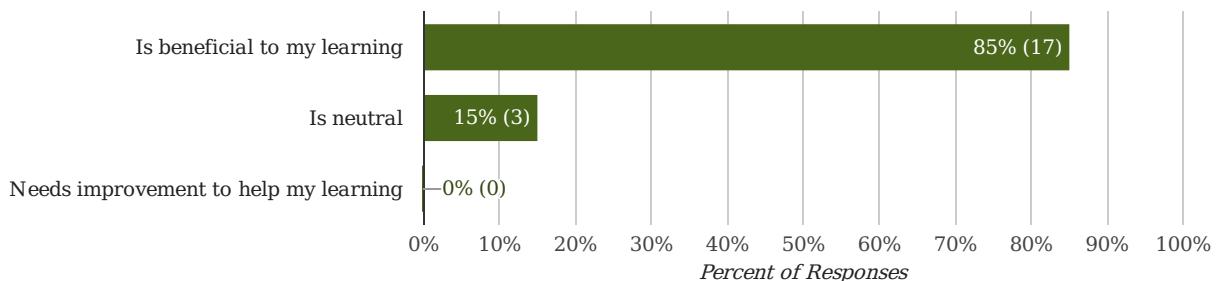
Final Question (2 comments)

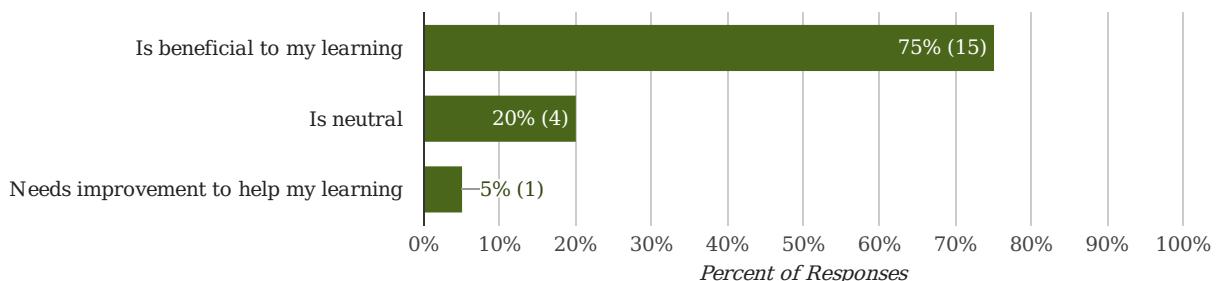
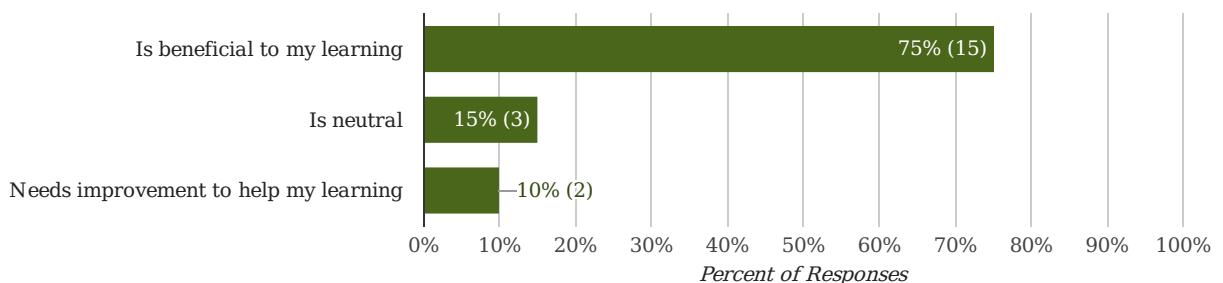
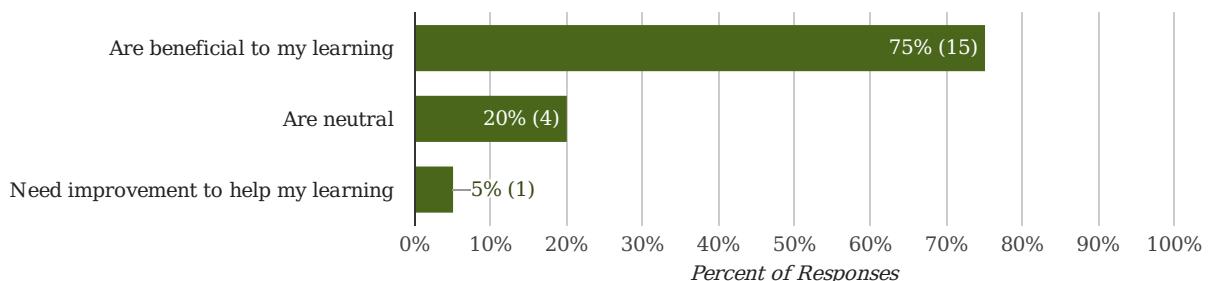
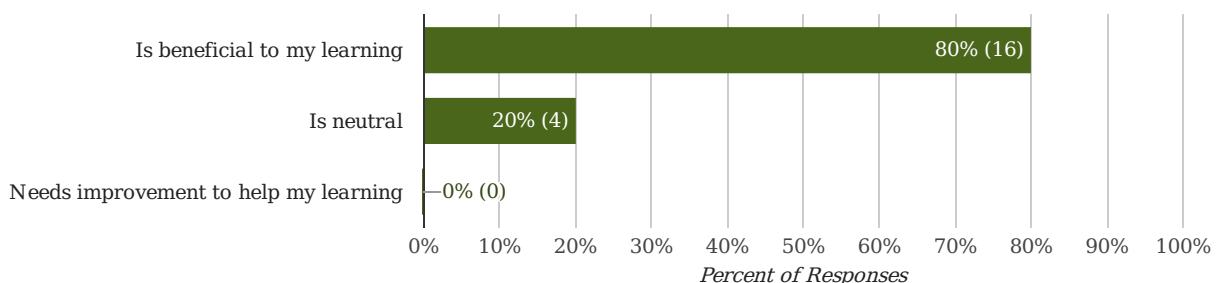
Q: What else would you like to say about your learning experience in the course? Please avoid personal comments about the instructor.

- 1 I'd like to say that I really liked this course. It was a reason for me to get up in the morning and made a huge difference in my life. Thank you so much.
- 2 I felt like Greg was probably the second best math teacher I've ever had and if we were in person he probably would have been the first.

Teaching and Learning Elements

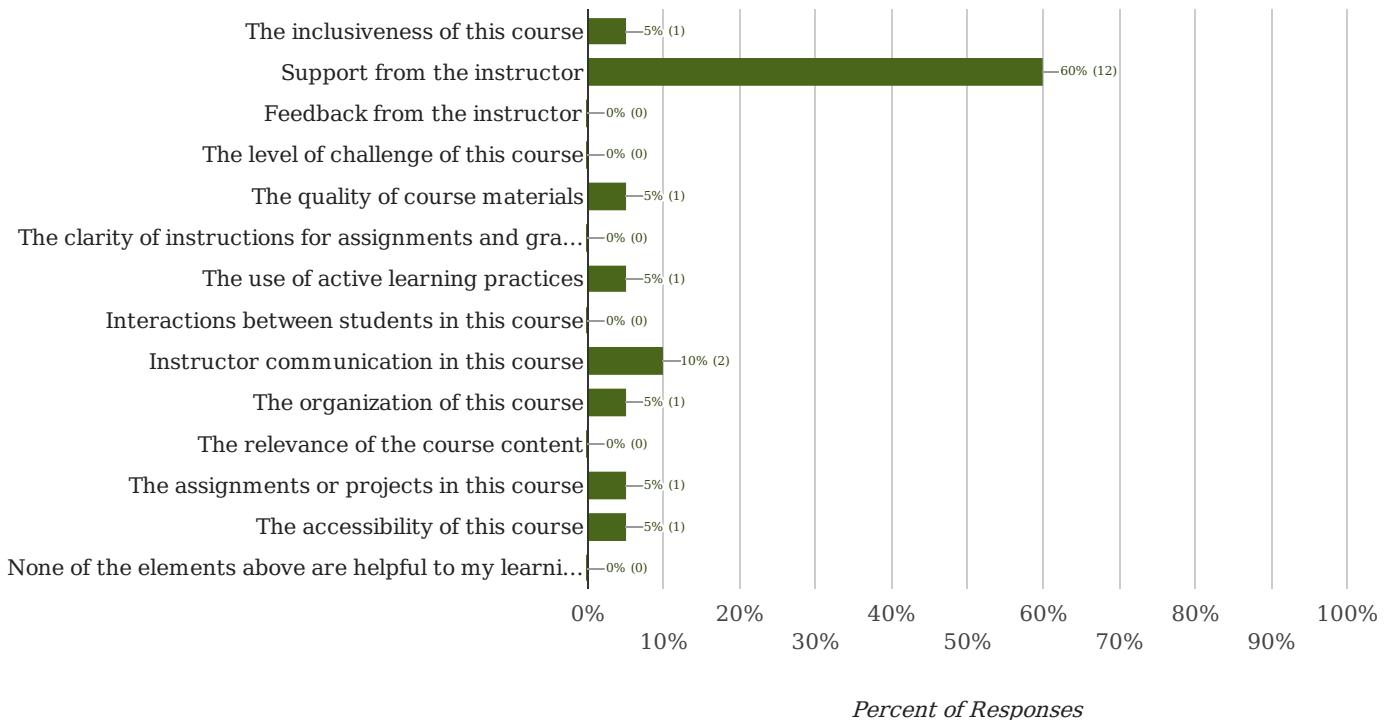
The inclusiveness of this course:**The support from the instructor:****The feedback provided:****The level of challenge in the course:**

The quality of the course materials:**The clarity of assignment instructions and grading:****The degree to which the course includes active learning:****The opportunities for student interaction in this class:****Instructor communication:**

The organization of the course:**The relevance of the course content:****The assignments or projects in this course:****The accessibility of the course:**

Most Beneficial

Please select the teaching element that has been MOST helpful to your learning, and then provide a detailed written comment about what worked well and why.



Most Beneficial Comments

What's Been MOST Helpful to Your Learning? (20 comments)

Q: What specifically about the inclusiveness of the course helped your learning?

- 1 he gives everyone the time of day

Q: What specifically about the support from the instructor helped your learning?

- 1 Greg was super supportive in making sure that the whole class understood the subjects we were learning. When someone asked a question he would answer it multiple ways until they understood it, not just give it one answer. He took time to ask the students how we wanted to make changes to the course structure and almost immediately put those changes into the course, quickly reorganizing everything for us.
- 2 The instructor was always willing to make time to meet with me if it meant that it would help me understand the content better.
- 3 The instructor always helped us by answering our questions in a cooperative manner.
- 4 The mid-year changes to the course structure helped my learning the most.
- 5 Always adjusting to the level of the class
- 6 Greg has been a very approachable and supportive professor. He's willing to restate questions or explanations to provide further clarity, and he's very open and responsive to questions. He's clearly passionate about math, and it shows in his willingness to teach cooperatively.
- 7 He always answered all of our questions and responded to emails very quickly
- 8 Greg was very accommodating with me and my ADHD.

- 9 Greg has been supportive in my learning throughout this course. He has polled the class and made beneficial adjustments to match our suggestions. One of the most beneficial adjustments that he made was a change in the course structure that allowed us to practice problems during class and receive immediate feedback.
- 10 Greg made it easy to come to him with questions, and was happy to put in more work to help us learn the material.
- 11 making up quizzes was easy and I felt no stress communicating with him about it or meeting to make it up
- 12 I believe that Professor Knapp is a very adaptable instructor and really wants every student to succeed in this class. He is very open to suggestions from his students on changes that would be beneficial to the class learning and makes changes immediately to things that he believes he could work on within the class as an instructor. He is also always there for the students and is honest and very clear, and communicative to us, which has helped me immensely in the course. He has been one of my favorite professors in my three years here and I am very thankful to him.

Q: What specifically about the level of challenge helped your learning?

Q: What specifically about the feedback helped your learning?

Q: What specifically about the quality of course materials helped your learning?

- 1 the lecture guides were helpful and the overall material was easy to access

Q: What specifically about the clarity of instructions helped your learning?

Q: What specifically about the use of active learning helped your learning?

- 1 I really like seeing examples, or steps. Having it broken down like that is very clear.

Q: What specifically about the interactions between students helped your learning?

Q: What specifically about instructor communication helped your learning?

- 1 Greg always made sure to accommodate to everyone's needs in class
- 2 Greg Knapp is an excellent teacher. His teaching really helped me understand the course material.

Q: What specifically about the organization of this course helped your learning?

- 1 I really enjoyed the guided notes. That always makes learning a lot easier when you can easily follow and organize your own notes.

Q: What specifically about the relevance of the course content helped your learning?

Q: What specifically about the assignments or projects helped your learning?

- 1 Relevant homework problems allowed for proper studying before exams.

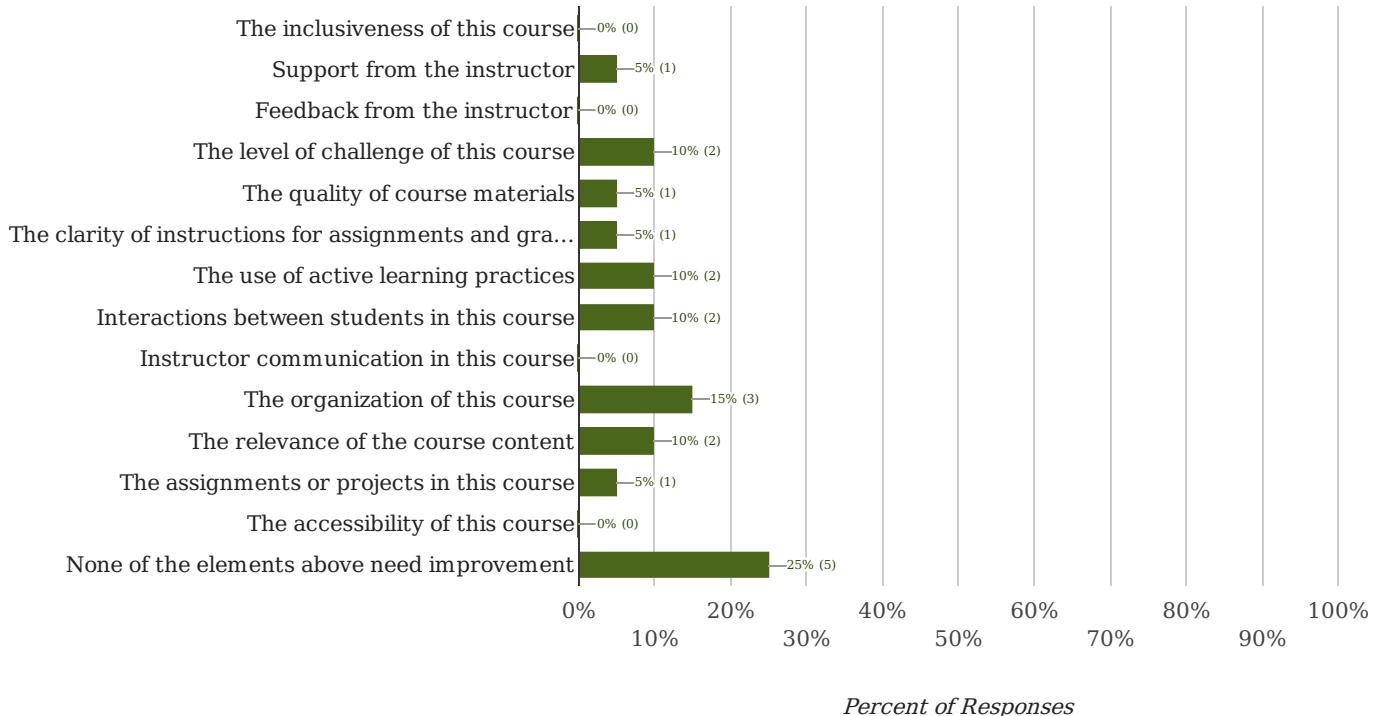
Q: What specifically about the accessibility of this course helped your learning?

- 1 you can access materials easily on CANVAS at any time

Q: Please say more about how none of the teaching elements above were helpful to your learning.

Most In Need of Improvement

Please select one teaching element that could most use some improvement to help you learn, and then provide a detailed written comment about what specific changes you suggest.



Most In Need of Improvement Comments

What Could MOST Use Some Improvement to Help you Learn? (20 comments)

Q: What specific change in the inclusiveness of the course would help your learning?

Q: What specific change in the support from the instructor would help your learning?

1 more accommodations

Q: Was the course too hard or too easy? What specific change related to the level of challenge would help your learning?

1 I would have enjoyed some more challenging stuff on the side maybe

2 I found the course work quite challenging and would have preferred that we had some easier problems assigned on the written homework to allow me to get my footing before moving on to the harder problems.

Q: What specific change in the feedback would help your learning?

Q: What specific change in the quality of course materials would help your learning?

- 1 I really feel like sometimes the content can be very difficult. Like the learning curve for it is very steep. That being said, it could just be my opinion.

Q: What specific change in the clarity of instructions would help your learning?

- 1 Most weeks, the intended material got pushed forward into the next week. A lot of the time this was out of Greg's hands as class was only 50 minutes long, and I would much rather have my questions answered, but it did lead to a bit of a rush on some topics. It also shifted the homework due dates, so there wasn't a lot of consistency.

Also, the practice of having homework graded for correctness instead of completeness caused a great deal of stress for me. In terms of these assignments, I felt that I was being penalized for being imperfect when I had never seen these types of problems before. Of course, a class must be graded on something, and I understand that it is important to practice correctly, but I feel that this method leaves much room for improvement.

Q: What specific change in the use of active learning would help your learning?

- 1 Participation through Socrative felt a bit like a chore rather than an opportunity to apply. The groupwork format was a good change.
 - 2 I would enjoy more in class problems, granted I didn't attend for so much of the class because of personal issues so I wouldn't know if he changed it throughout the course or not

Q: What specific change in instructor communication would help your learning?

Q: What specific change in the interactions between students would help your learning?

- 1 I think that something that would help is having group work in class (something implemented towards the end of the course).
 - 2 I think more student interactions could create a better environment to learn in.

Q: What specific change in the organization of the course would help your learning?

- I did not like the change to the video assignments because I learn better in person. It made it confusing because it felt like I was learning from like two different people.
 - Greg was very well organised every class and took comments and suggestions extremely well!
 - just the new assignment due dates really got me confused and if you could label the lecture slides that would have been great

Q: What specific change in the relevance of the course content would help your learning?

- 1 We did not learn any real life applications for the math so it didn't make it feel as important to learn. It felt trivial.
 - 2 I am still struggling with the application of the course material into the real world.

Q: What specific change in the assignments or projects would help your learning?

- 1 Sometimes the homework was way harder than class which resulted in it being very difficult

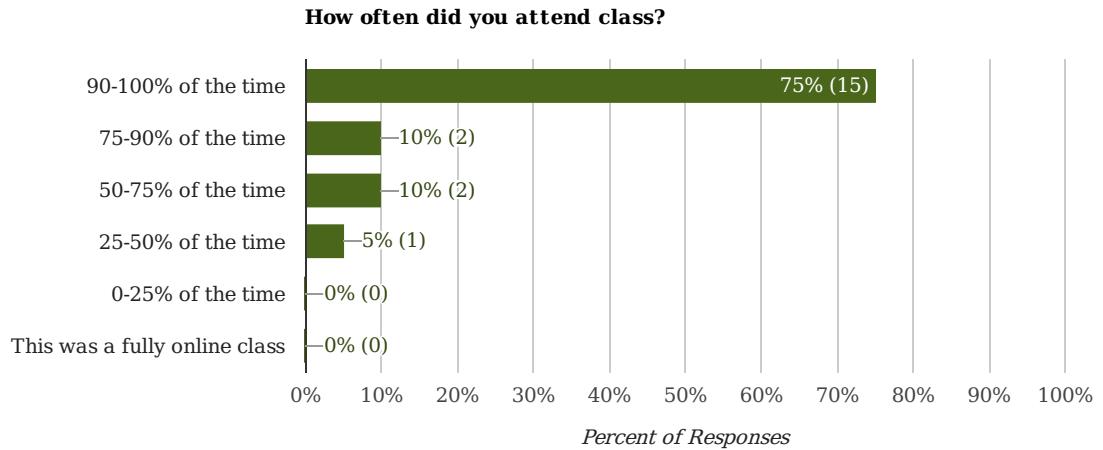
Q: What specific change in the accessibility of the course would help your learning?

Q: Please say more about how none of the teaching elements above need improvement to help your learning.

- 1 I think this course was great. It's a hard class, but it was taught well.
 - 2 I absolutely loved this course due to Greg's teaching ability and wish I could have this style of instructor for all of my classes.
 - 3 it was all well-done
 - 4 Greg was very adaptive with the structure of this course.

- 5 I believe that Professor Knapp has created a very well-rounded and balanced course for the students. His lectures make concepts a lot more simple to understand, and he has done a very great job dumbing things down to make them very accessible for the brain to process and understand. The exams are challenging, as they should be, maybe a little too challenging compared to the practice problems, if I nitpick and try to find one suggestion, but overall this class is great.

Student engagement in their own learning



How Did You Support Your Own Learning? (17 comments)

Q: Why did you attend class 90-100% of the time?

- 1 I felt incentivized for attending and I don't like missing classes
- 2 So I can see in person work.
- 3 I enjoyed the class because I was actively learning in it and it is important to be in class especially for our weekly quizzes.
- 4 Attending class would help understand how to do the assignments and would allow me to ask my professor for help face-to-face
- 5 I want to do well
- 6 The lectures helped me understand the material
- 7 Because I believe in going to class
- 8 I learned most from attending class, it was interactive and engaging. Best Calculus teacher I have had!
- 9 I want to succeed in the class and would not be able to if I didn't attend.
- 10 I enjoyed class, and being in class was helpful in learning to the material.
- 11 helped me understand material better
- 12 so my grade doesn't suffer

Q: Why did you attend class 75-90% of the time?

- 1 I really enjoyed this class, but late November is a hard time of the year for me personally. Missing classes had nothing to do with the professor. Greg did an excellent job of updating material for missed classes. The video lectures were an excellent resource.
- 2 The class is very early for someone that has trouble with insomnia and tends to fall asleep at late times in the night, but I always tried to make it because this was a class that I genuinely wanted to go to.

Q: Why did you attend class 50-75% of the time?

1 Personal reasons

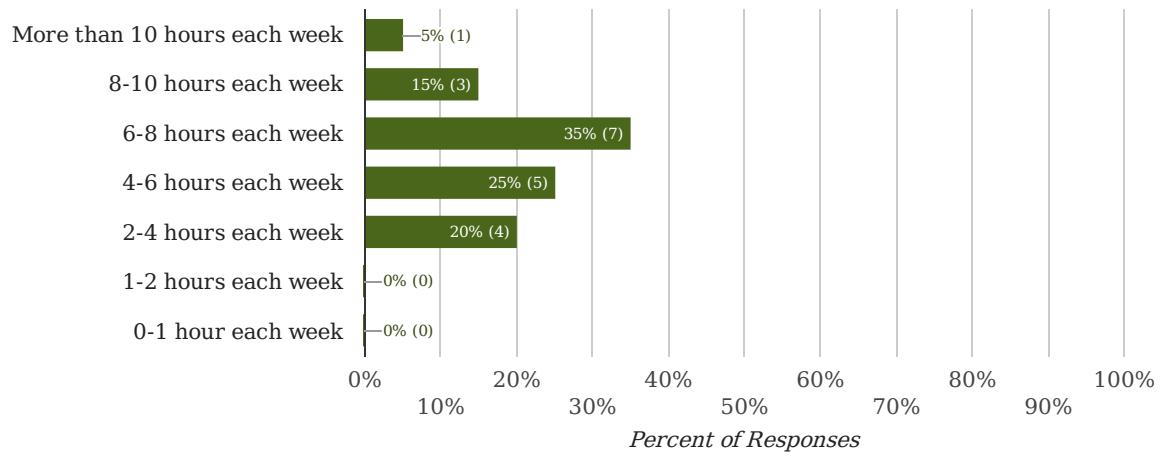
2 found out I would prefer do to remote learning due to some mental health issues

Q: Why did you attend class 25-50% of the time?

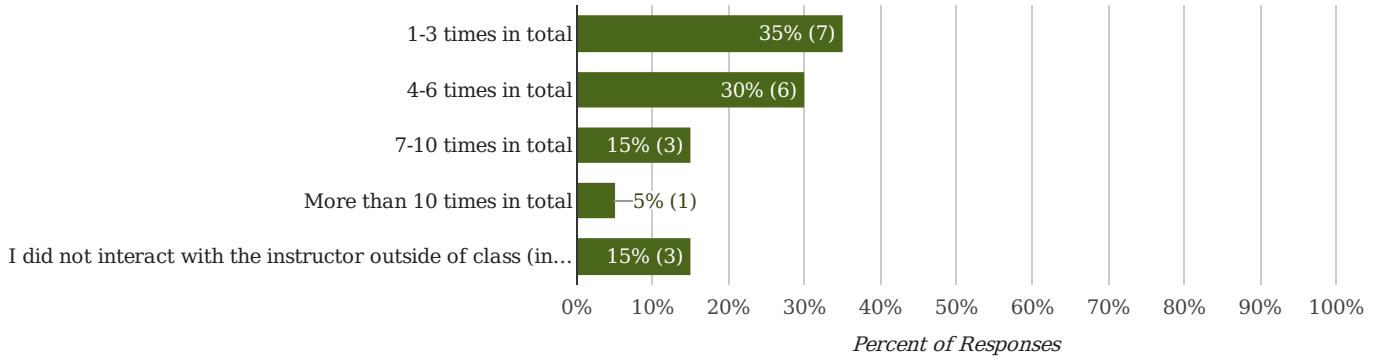
1 I am diagnosed with depression and anxiety

Q: Why did you attend class 0-25% of the time?

How many hours per week did you spend on this course (not including any face-to-face class time)?



Approximately how many times did you interact with the instructor outside of class (e.g. by email, office hours)?



COVID Impact

Impacts on my Learning (15 comments)

Q: Describe any challenges you may have faced this session: for example have you experienced technology/connectivity issues, home/personal issues, limited motivation, time management challenges, or distractions that have negatively impacted your learning?

1 none

- 2 I feel I haven't had many struggles with this course. I could have performed better in certain aspects, but I feel like I understood everything.
- 3 I personally started getting really tired of school around Thanksgiving break, so unfortunately the last week of school after that was a bit harder to concentrate and I just wanted to be done.
- 4 I have commitments outside of this class that I have to do in order to continue my education here at the U of O so that gave me less time to really grasp the course material.
- 5 Homework assignments were due at bad times which made us have to cram. We also couldn't get ahead on the course material during the weekend because we didn't know how to do the homework until the day it was due.
- 6 I'm a freshman and am still getting used to college. So mostly non-school related activities negatively impacted my learning.
- 7 The largest negative impact on my learning was an illness that forced me to miss class.
- 8 The difficulty of some of the work.
- 9 Coming back after quarantine, working with classmates feel intimidating. I would learn much better with peers outside of class rather than just groupwork in class.
- 10 limited motivation
- 11 I faced challenges for accessing the UO course surveys. I also faced the challenge of learning from videos online. I do not learn well that well. But overall a great person and a great teacher.
- 12 Only thing which I have already talked with him about was the videos for lectures sometimes not showing up.
- 13 n/a
- 14 my sister who has bipolar 2 came back in the middle of the term to stay with me and go home because of a depressive episode, then just in general my mental illness systems have been elevated and I have met with my therapist but for now it's on me to figure out how to get the motivation to get out of bed and do my homework
- 15 Sometimes, I struggle to find the passion I once had for STEM, and apply it to my learning.

Is there anything else you would like to say about your learning experience?

Final Question (4 comments)

Q: What else would you like to say about your learning experience in the course? Please avoid personal comments about the instructor.

- 1 The grading was much too harsh. The fact that I lost majority of the points on a question for just not including a number in our answer that was already given to us is ridiculous.
- 2 I feel like sometimes the content on the quiz did correlate to the what we were told to study. Also the quizzes should be consistent in hardness. Some quizzes seemed a bit easier than others. Thanks so much for a great quarter!
- 3 Thank you for a wonderful course, I hope your mathematics journey treats you well and you come up with a way to describe all those solutions! :D
- 4 Professor Knapp, I really hope that you see this. As someone that is taking Calculus II for the second time, I would like to truly applaud you and commend you for your teaching skills, and the way that you have helped me understand the material in this class. The last time I took this course, I struggled very much with the professor, and you have never given me a moment of struggle from your end. The concepts are hard, and I don't have a huge love for calculus and it is not easy for me to grasp it, but the way that you teach things has truly made it so much easier for me, and you have really helped me in understanding. Thank you so much.

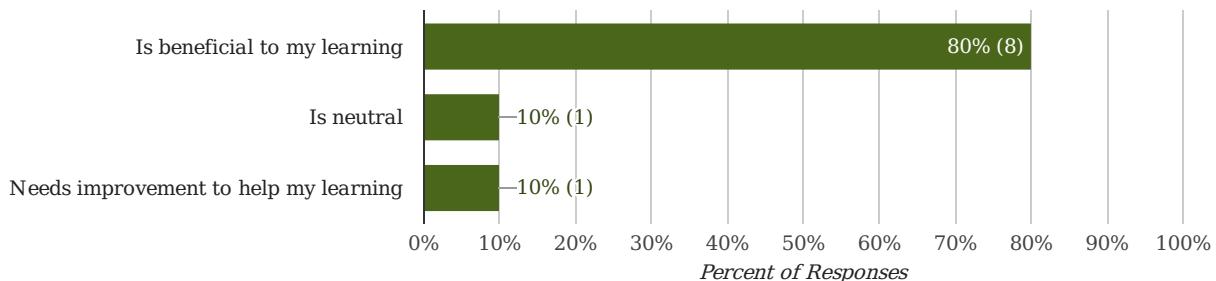
Fund of Number Theo I (Winter 2022 E-SES)

Instructor: **Knapp, Greg**
 Subject: **Mathematics**
 Catalog & Section: **347 24053**

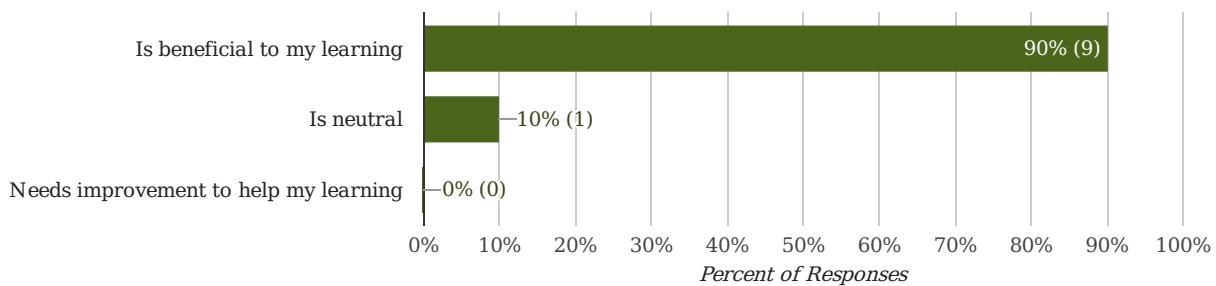
Enrollment: **19**
 Responses Incl Declines: **10**
 Declines: **0**

Teaching and Learning Elements

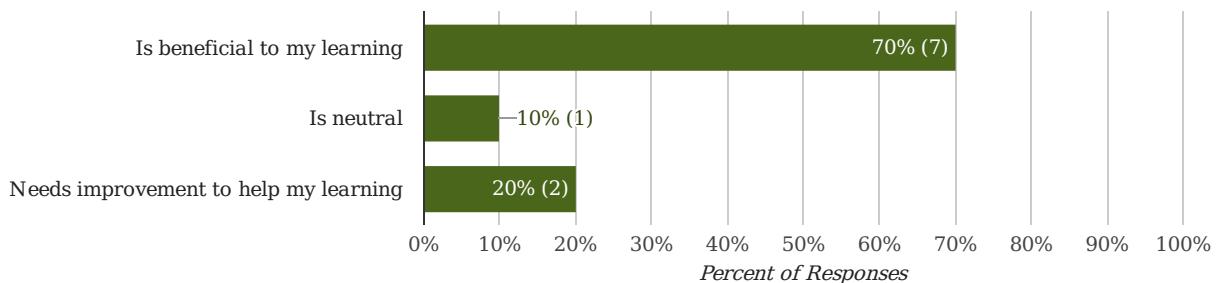
The inclusiveness of this course:



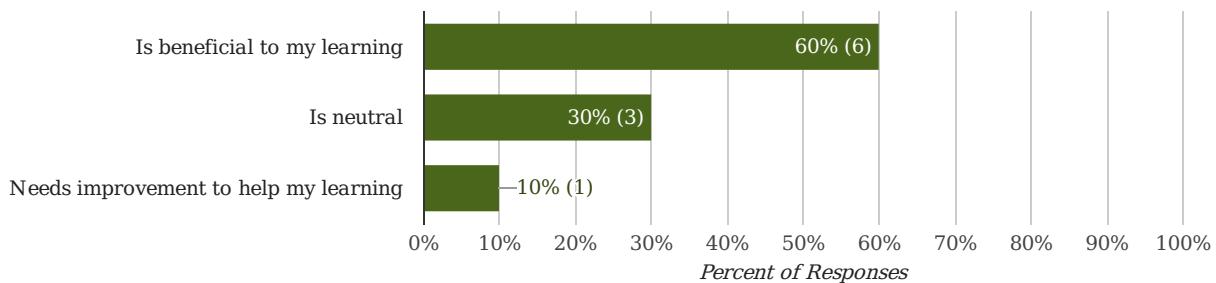
The support from the instructor:

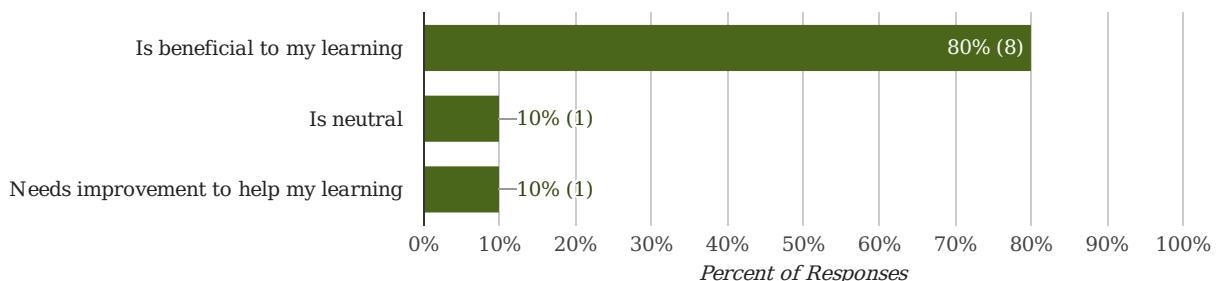
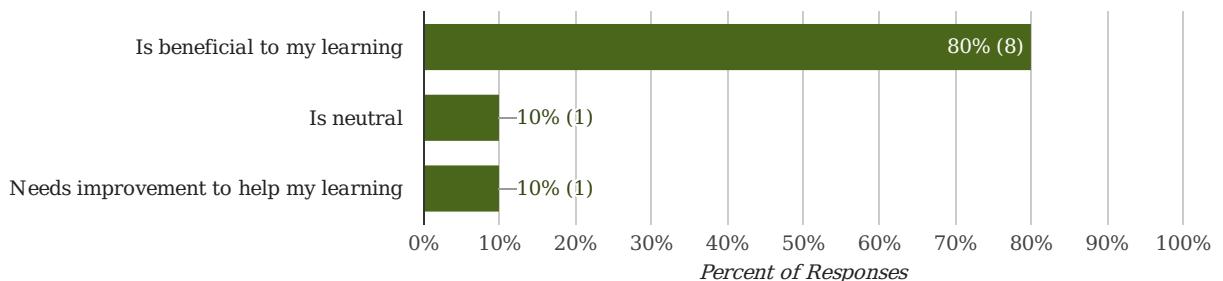
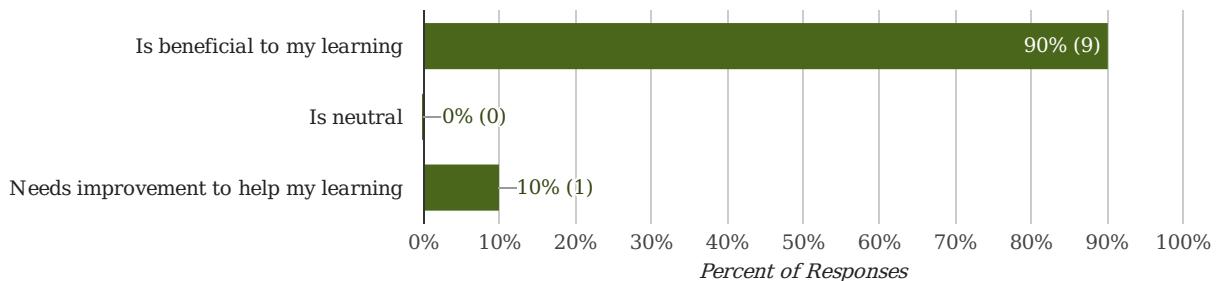
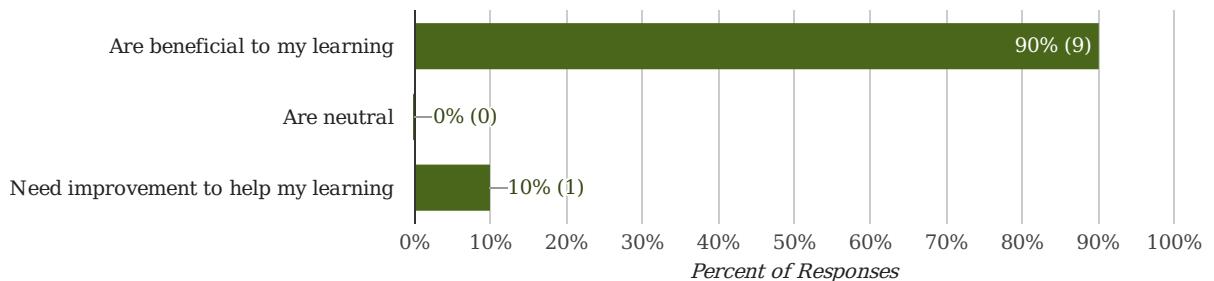
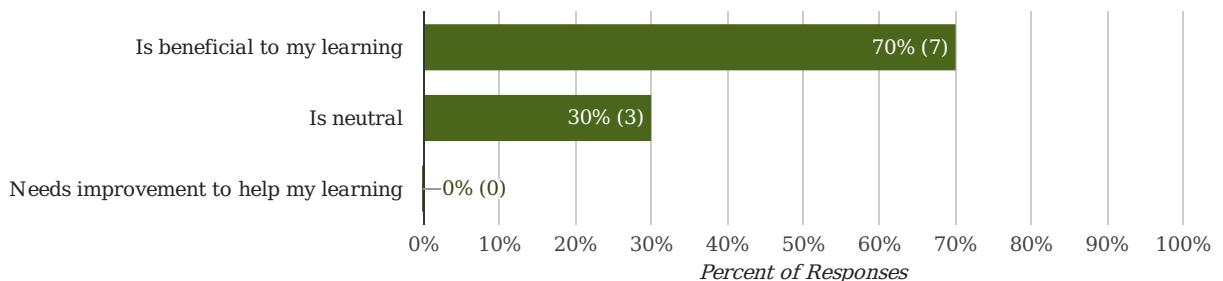


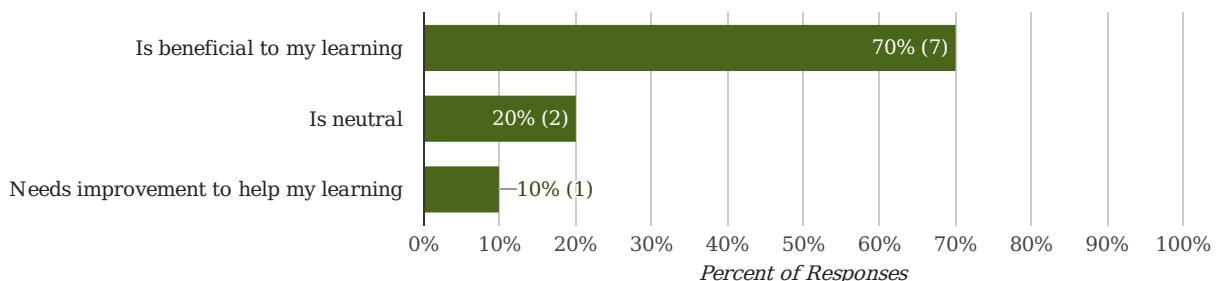
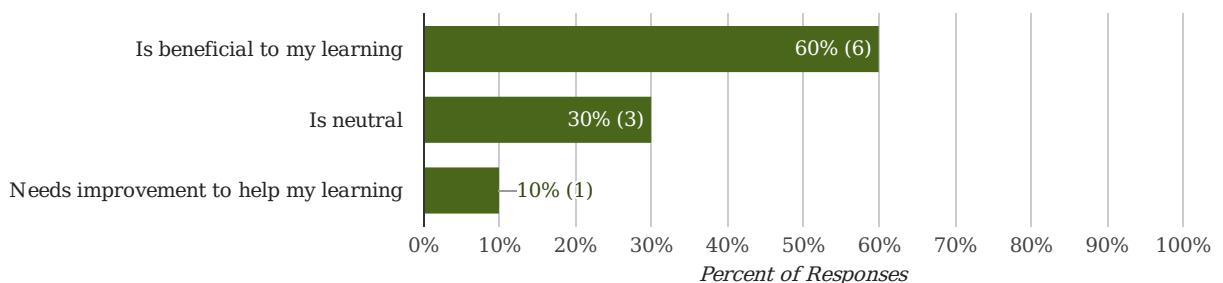
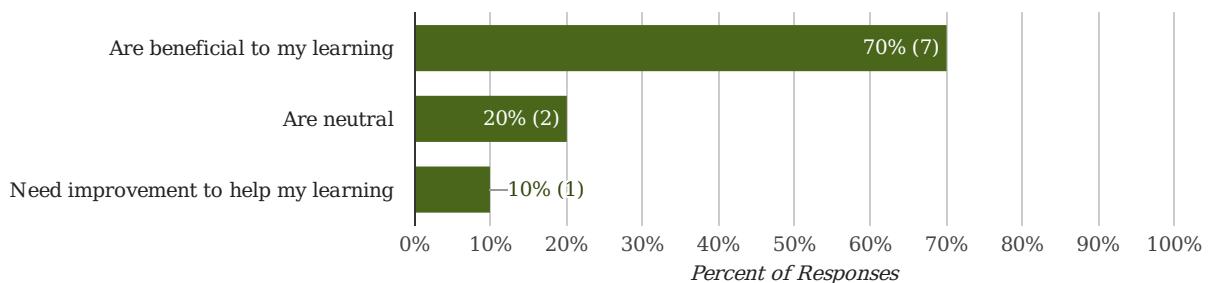
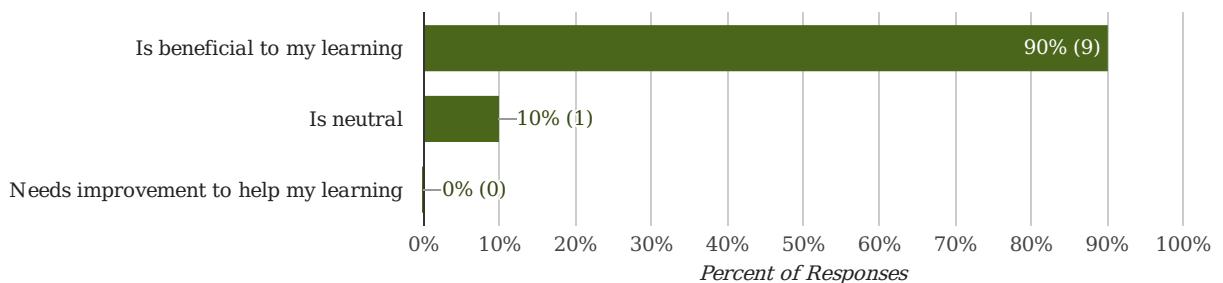
The feedback provided:



The level of challenge in the course:

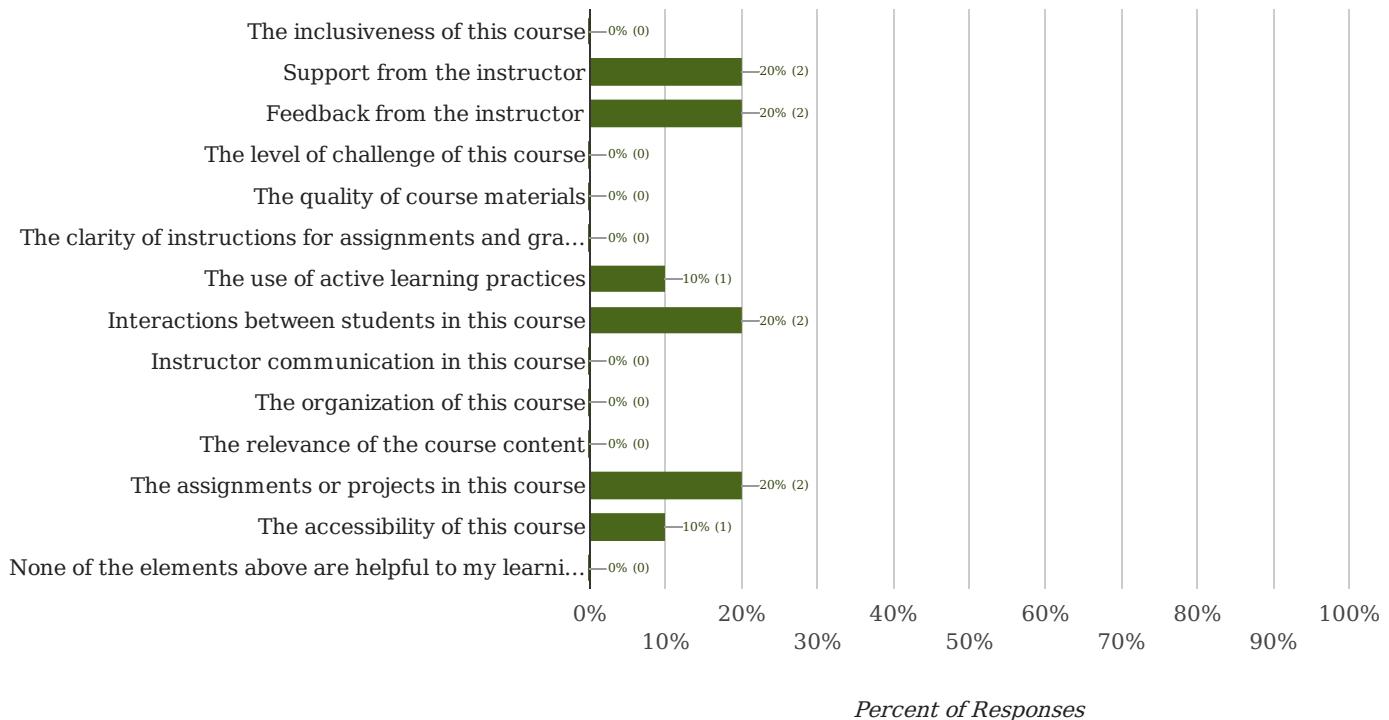


The quality of the course materials:**The clarity of assignment instructions and grading:****The degree to which the course includes active learning:****The opportunities for student interaction in this class:****Instructor communication:**

The organization of the course:**The relevance of the course content:****The assignments or projects in this course:****The accessibility of the course:**

Most Beneficial

Please select the teaching element that has been MOST helpful to your learning, and then provide a detailed written comment about what worked well and why.



Most Beneficial Comments

What's Been MOST Helpful to Your Learning? (10 comments)

Q: What specifically about the inclusiveness of the course helped your learning?

Q: What specifically about the support from the instructor helped your learning?

- 1 The instructor has done a great job at making office hours available for everyone. I feel like I learned the most over all during office hours and outside communication from the instructor.
- 2 Greg gave challenging homework assignments, but he knew how to help his struggling students. Every time I went to his office hours, I left feeling like I understood everything.

Q: What specifically about the level of challenge helped your learning?

Q: What specifically about the feedback helped your learning?

- 1 With the very specific and detailed feedback from homeworks, I've learned a lot what I did good and what I did not good. It really helps me to answer a math problem in a professional and mathematical way.
- 2 The feedback of each assignment is very detailed, which can effectively point out my wrong understanding of the assignment.

Q: What specifically about the quality of course materials helped your learning?

Q: What specifically about the clarity of instructions helped your learning?

Q: What specifically about the use of active learning helped your learning?

- 1 Greg does a great job encouraging students to ask questions and providing weekly opportunities to apply what we've learned during class time

Q: What specifically about the interactions between students helped your learning?

- 1 Every Friday we were given worksheets to work as a group with other students and this helped me. How? Well I am the kind of person that does not do much for class other than the homework and assignments. Within a group of students I was able to reinforce my understanding of class material and work through different applications that we might not cover on the homework.
- 2 Group work is quite helpful I have found

Q: What specifically about instructor communication helped your learning?

Q: What specifically about the organization of this course helped your learning?

Q: What specifically about the relevance of the course content helped your learning?

Q: What specifically about the assignments or projects helped your learning?

- 1 I liked the Draft/Review/Final model for homework assignments since I got to see other ways to solve problems and it forced me to start thinking about each assignment early.
- 2 .

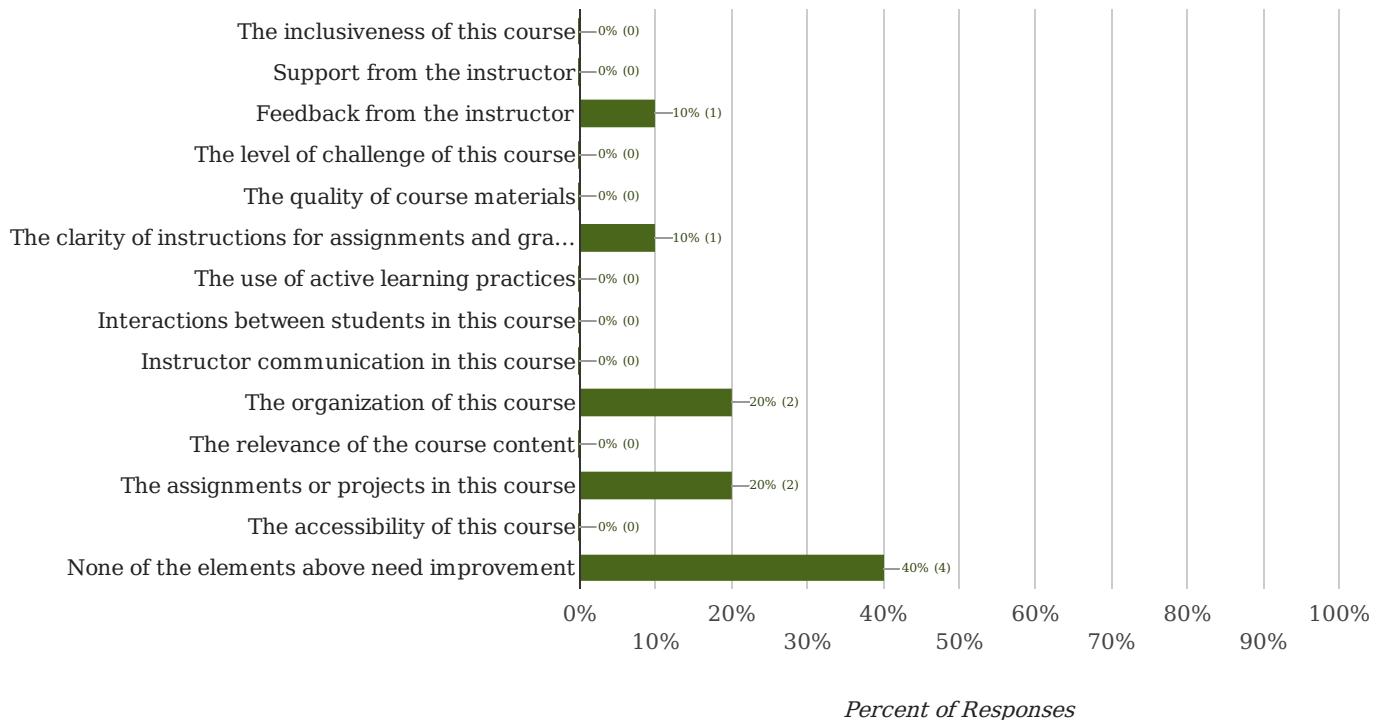
Q: What specifically about the accessibility of this course helped your learning?

- 1 Greg offers both in person as well as a synchronous zoom option, which is very accommodating and allows everyone to be able to attend class and receive the same course material.

Q: Please say more about how none of the teaching elements above were helpful to your learning.

Most In Need of Improvement

Please select one teaching element that could most use some improvement to help you learn, and then provide a detailed written comment about what specific changes you suggest.



Most In Need of Improvement Comments

What Could MOST Use Some Improvement to Help you Learn? (9 comments)

Q: What specific change in the inclusiveness of the course would help your learning?

Q: What specific change in the support from the instructor would help your learning?

Q: Was the course too hard or too easy? What specific change related to the level of challenge would help your learning?

Q: What specific change in the feedback would help your learning?

1 It would have been helpful if assignments were graded sooner

Q: What specific change in the quality of course materials would help your learning?

Q: What specific change in the clarity of instructions would help your learning?

Q: What specific change in the use of active learning would help your learning?

Q: What specific change in instructor communication would help your learning?

Q: What specific change in the interactions between students would help your learning?

Q: What specific change in the organization of the course would help your learning?

- 1 The course organization is beneficial to my learning because I am able to do a draft of a homework get it peer reviews and then revise to submit the final. But this is like 3 assignments for one HW so it might be beneficial to my overall learning but it can be overwhelming during midterms weeks with other classes.
- 2 Sometimes assignments don't have the submit button. Not the end of the world just can throw you off sometimes

Q: What specific change in the relevance of the course content would help your learning?

Q: What specific change in the assignments or projects would help your learning?

- 1 Some of the problems from the assignments were extremely challenging, making it hard to always complete. It would be more beneficial to be able to complete all problems than having to skip some since they are too difficult to finish.
- 2 Assignments usually have little connection with the textbook or with lectures. The lectures tend to be primarily running through proofs with little examples or explanation of their uses, leaving students ill-prepared for any use or knowledge to solve problems. The peer review for the class is more harmful than helpful, leaving students with incorrect comments that could have easily been remedied if the comments that the instructor left on everyone's peer reviews were instead focused on the person's work who was being reviewed. The instructor seems to have many too many assignments as he many times would fall weeks behind in grading leaving students with little feedback so they continue to be marked down for making the same mistakes over and over again from lack of timely feedback.

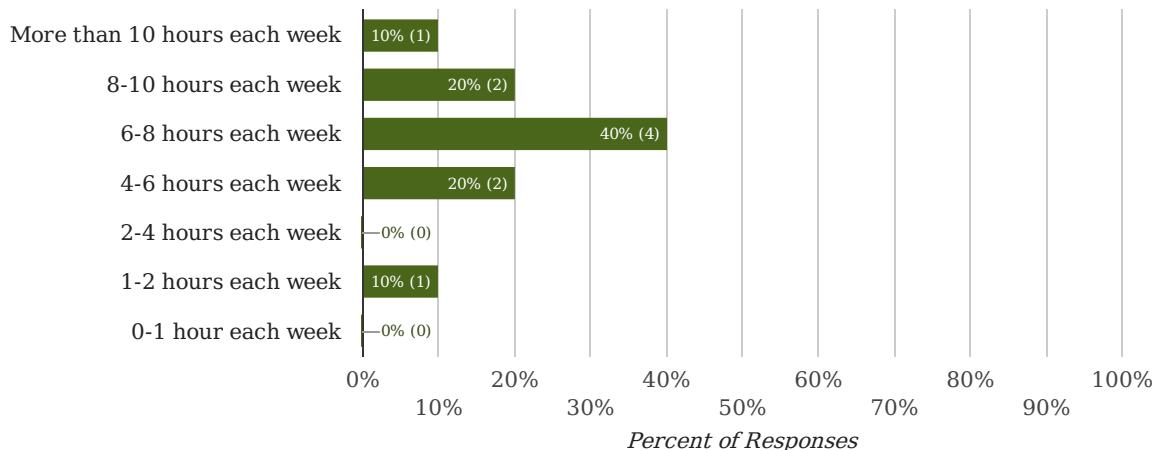
Q: What specific change in the accessibility of the course would help your learning?

Q: Please say more about how none of the teaching elements above need improvement to help your learning.

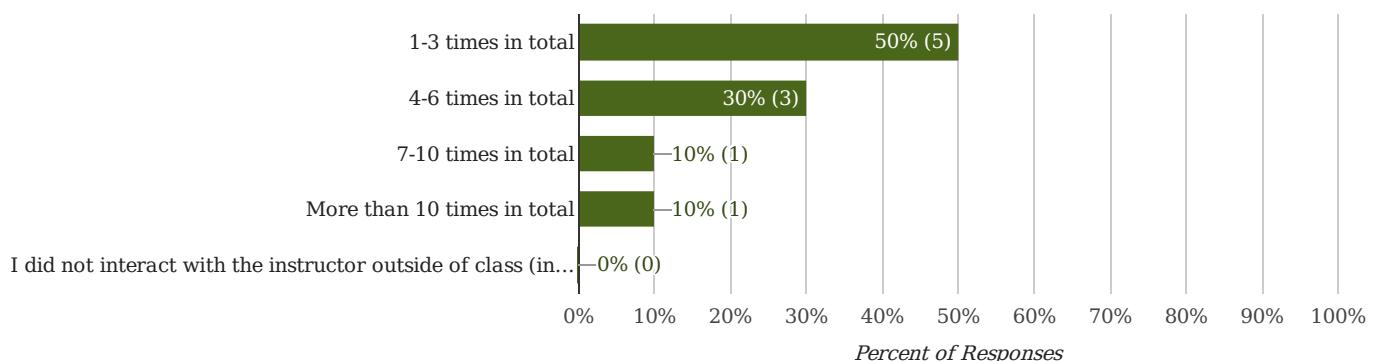
- 1 I think Greg has been doing a great job as an instructor. He cares about every student and I feel supported thought the term. The format of this class was designed in a good way so that we have time to practice in class and have enough time to finish homework and really learn stuff from revising homework. Especially the peer review session and using portfolio to replace "regular in class paper exam". The peer review session gives me a chance to learn how other student approach to the answer of same problem. The portfolio part provides a really good way to summarize and conclude what I have learned so far, it's kind of like a review but let you dive further into the knowledge.
- 2 I liked the course and the structure worked well for me.
- 3 I feel very comfortable with everything in this class so far.

Student engagement in their own learning

How many hours per week did you spend on this course (not including any face-to-face class time)?



Approximately how many times did you interact with the instructor outside of class (e.g. by email, office hours)?



COVID Impact

Impacts on my Learning (7 comments)

Q: Describe any challenges you may have faced this session: for example have you experienced technology/connectivity issues, home/personal issues, limited motivation, time management challenges, or distractions that have negatively impacted your learning?

1 no

2 N/A

3 I've had a lot of mental health issues, as many students have probably had during the pandemic. High levels of anxiety and depression have been amplified from attending this class.

4 I have been having limited motivation and poor time management. I am usually a lot better at managing my time, but this term I feel like I just do not have time to do everything needed done.

5 Personal health issues that also affected motivation

6 .

7 Everything went well

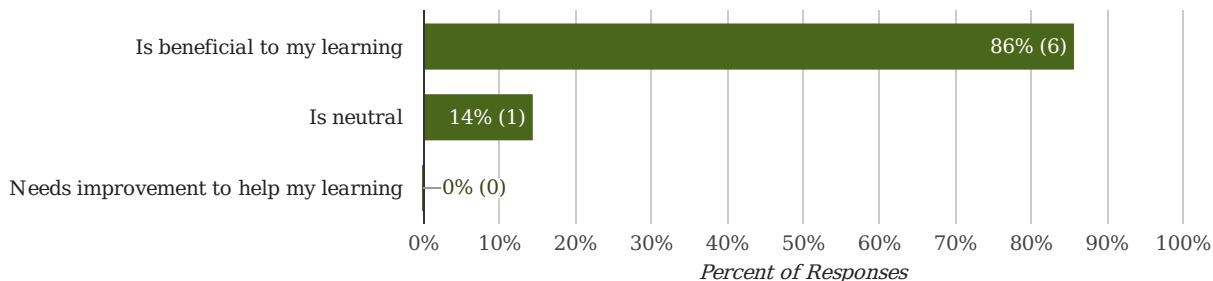
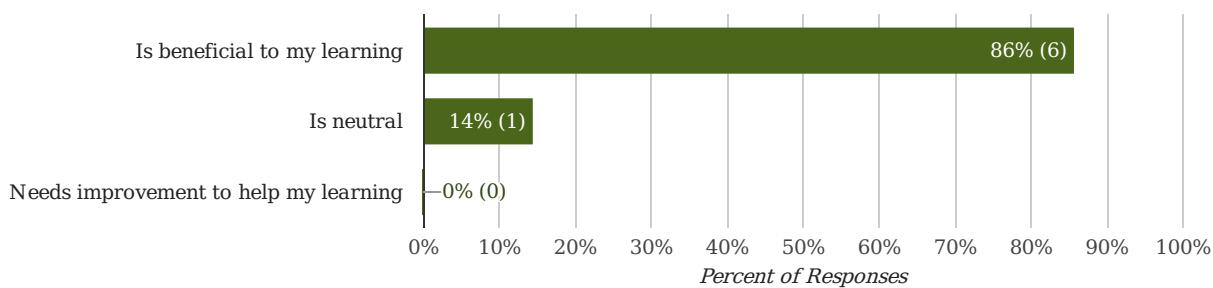
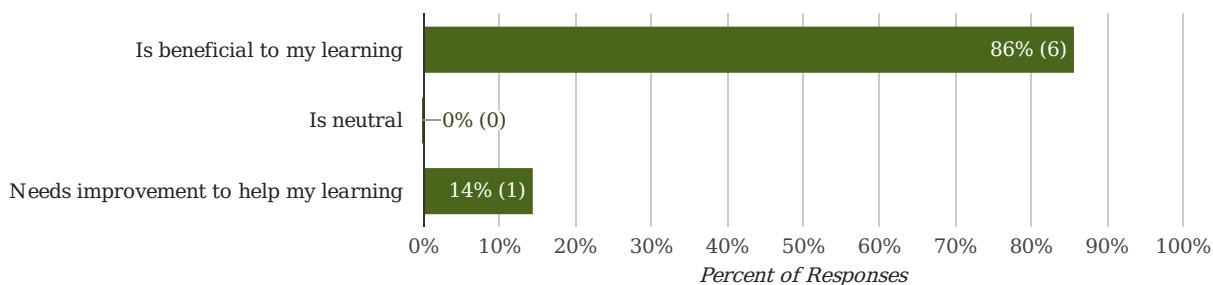
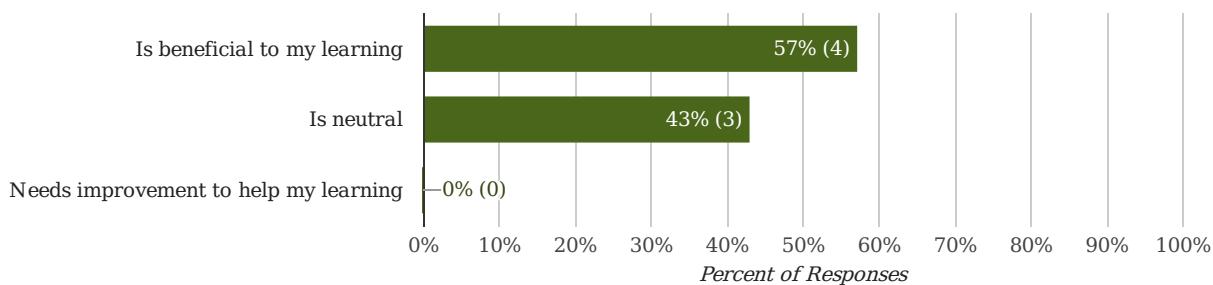
Is there anything else you would like to say about your learning experience?

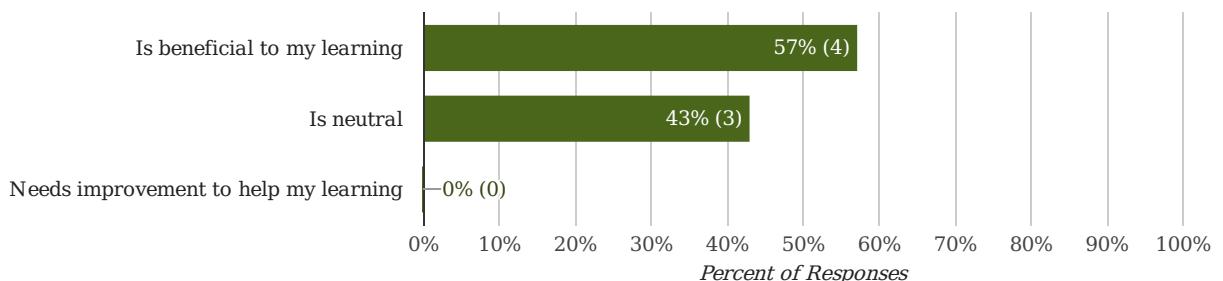
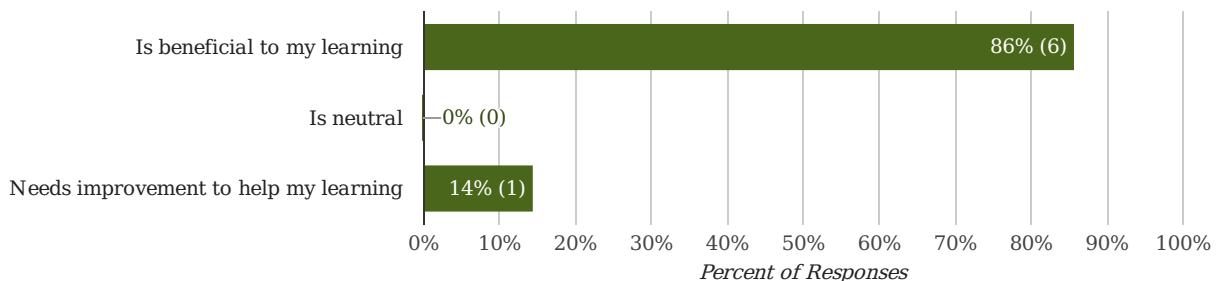
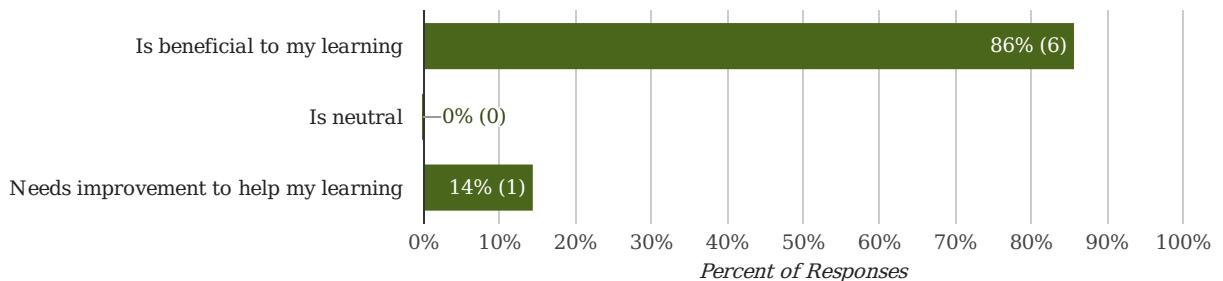
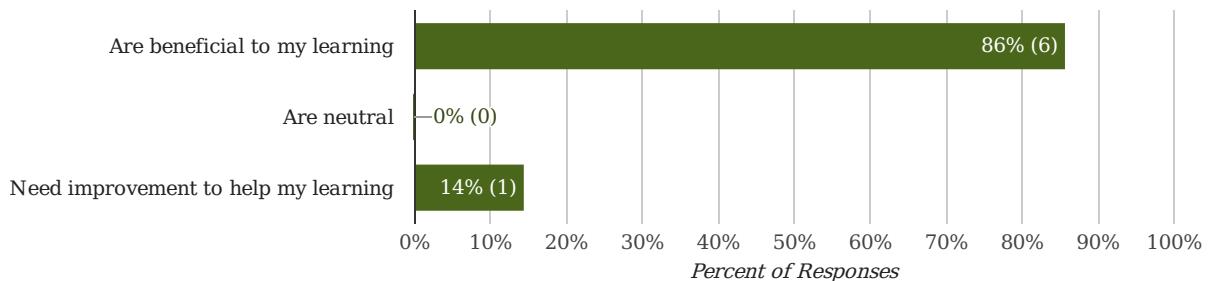
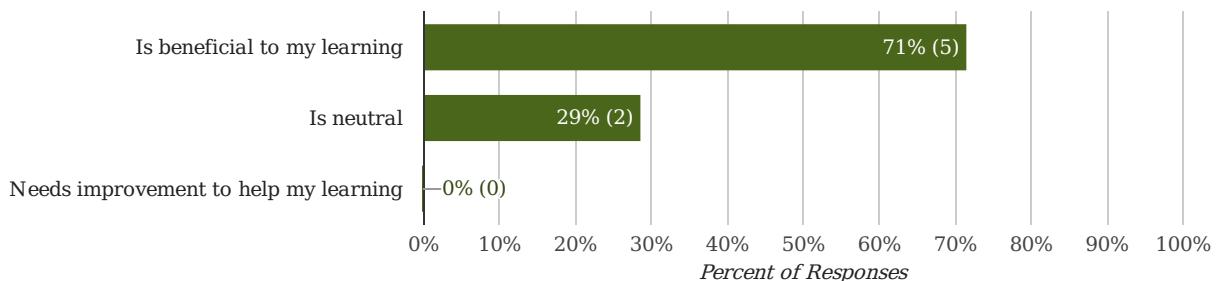
Final Question (2 comments)

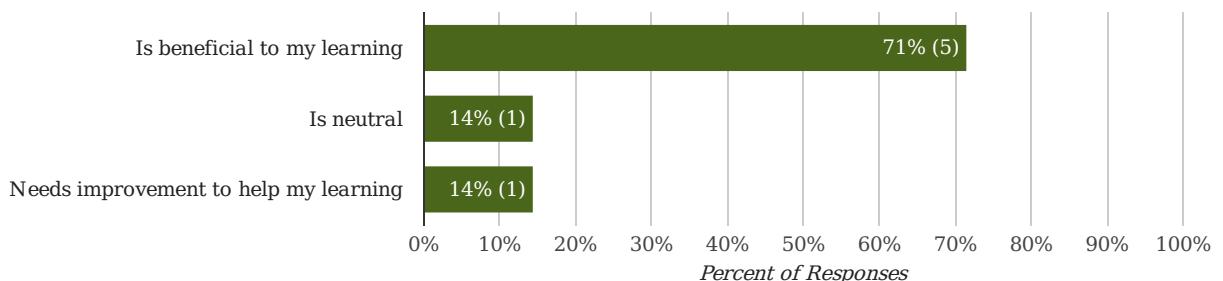
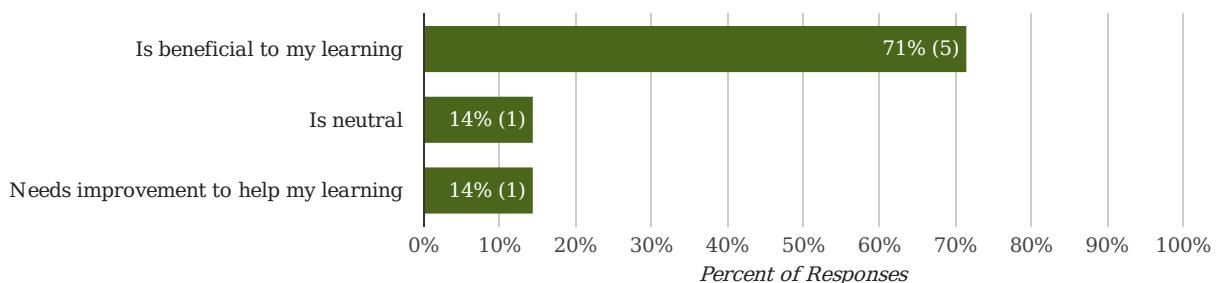
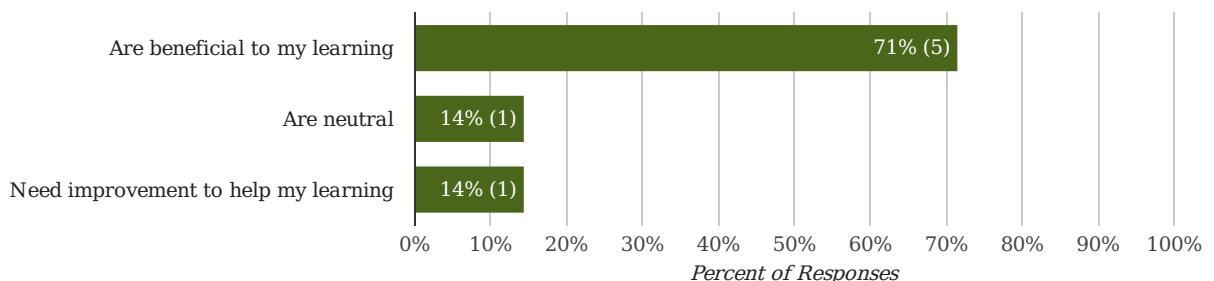
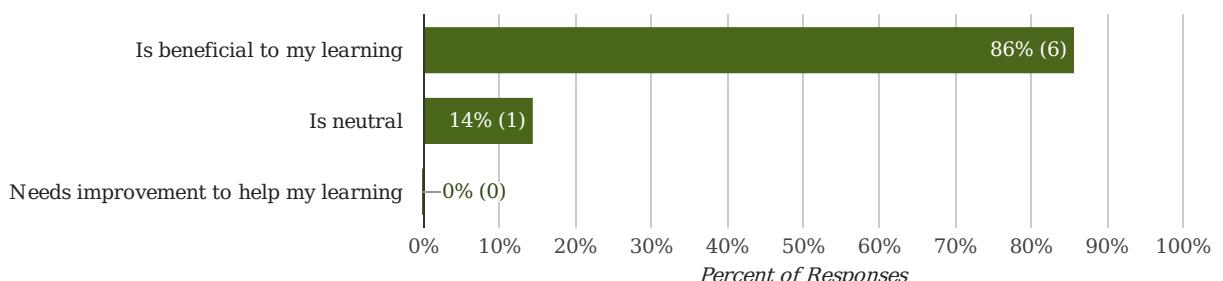
Q: What else would you like to say about your learning experience in the course? Please avoid personal comments about the instructor.

- 1 Overall this course was taught well and I enjoyed it. It was challenging, but still worth taking.
- 2 This class left me disappointed by the lack of structure, timeliness, and overall enjoyment. It did not meet my expectations for a rigorous high-level math class and needs to be restructured to incorporate active learning as well as timely feedback.

Teaching and Learning Elements

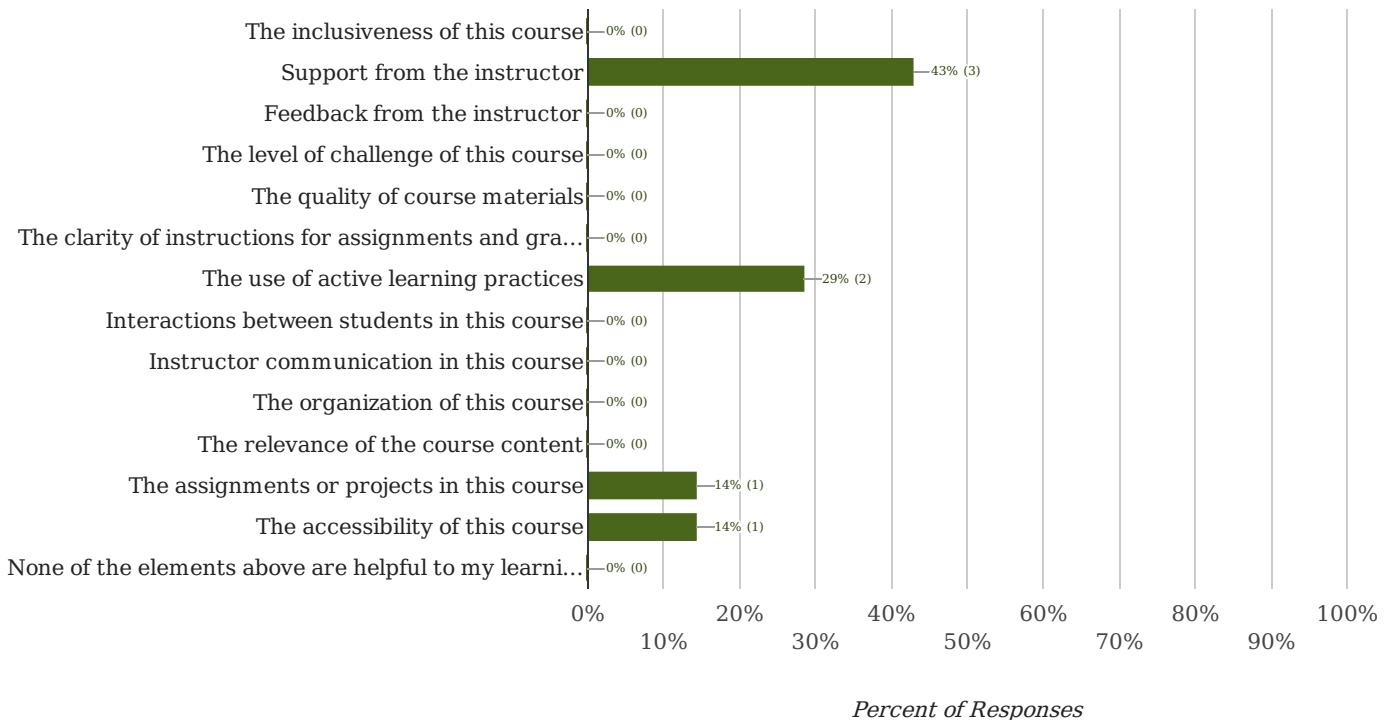
The inclusiveness of this course:**The support from the instructor:****The feedback provided:****The level of challenge in the course:**

The quality of the course materials:**The clarity of assignment instructions and grading:****The degree to which the course includes active learning:****The opportunities for student interaction in this class:****Instructor communication:**

The organization of the course:**The relevance of the course content:****The assignments or projects in this course:****The accessibility of the course:**

Most Beneficial

Please select the teaching element that has been MOST helpful to your learning, and then provide a detailed written comment about what worked well and why.



Most Beneficial Comments

What's Been MOST Helpful to Your Learning? (7 comments)

Q: What specifically about the inclusiveness of the course helped your learning?

Q: What specifically about the support from the instructor helped your learning?

- 1 great support in and outside class, on homework
- 2 Discussing problems one-on-one during class, after class, or in office hours
- 3 He helps us a lot with projects and assignments. He always uses different ways to follow and answer our questions.

Q: What specifically about the level of challenge helped your learning?

Q: What specifically about the feedback helped your learning?

Q: What specifically about the quality of course materials helped your learning?

Q: What specifically about the clarity of instructions helped your learning?

Q: What specifically about the use of active learning helped your learning?

-
- 1 I had a very positive experience with the final project which included some independent study.
 - 2 Having group work was helpful to discuss and think through the concepts that we learned each week.

Q: What specifically about the interactions between students helped your learning?

Q: What specifically about instructor communication helped your learning?

Q: What specifically about the organization of this course helped your learning?

Q: What specifically about the assignments or projects helped your learning?

-
- 1 Although challenging, I really like the course portfolio and final presentation/paper. I felt like doing these instead of exams helped me learn more useful, longterm, mathematics skills.

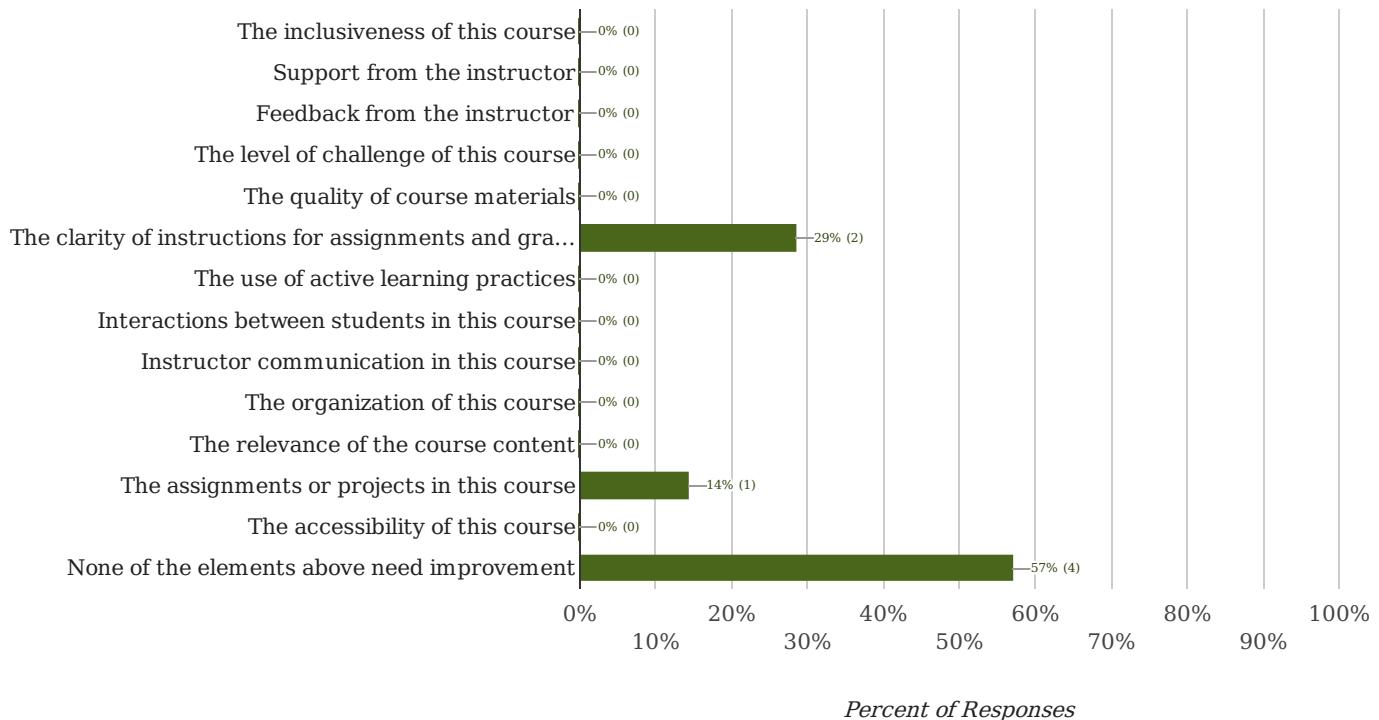
Q: What specifically about the accessibility of this course helped your learning?

-
- 1 Having class also as a zoom option and recordings is very useful especially during this time.

Q: Please say more about how none of the teaching elements above were helpful to your learning.

Most In Need of Improvement

Please select one teaching element that could most use some improvement to help you learn, and then provide a detailed written comment about what specific changes you suggest.



Most In Need of Improvement Comments

What Could MOST Use Some Improvement to Help you Learn? (5 comments)

Q: What specific change in the inclusiveness of the course would help your learning?

Q: What specific change in the support from the instructor would help your learning?

Q: Was the course too hard or too easy? What specific change related to the level of challenge would help your learning?

Q: What specific change in the feedback would help your learning?

Q: What specific change in the quality of course materials would help your learning?

Q: What specific change in the clarity of instructions would help your learning?

- 1 The grading rubrics are not reflective of learning but rather mark down on the very specific mistakes that do not convey anything meaningful to the problem/assignment being graded. Rubrics for homework are not consistent and are also not reflective of learning. It is hard to tell what can be done to improve from the rubrics and doesn't provide any feedback. Lots of confusion on what is really being graded and why certain marks are being made.

2 Mostly with the peer review, I wasn't always sure what constituted 'good' feedback.

Q: What specific change in the use of active learning would help your learning?

Q: What specific change in instructor communication would help your learning?

Q: What specific change in the interactions between students would help your learning?

Q: What specific change in the organization of the course would help your learning?

Q: What specific change in the relevance of the course content would help your learning?

Q: What specific change in the assignments or projects would help your learning?

1 I would recommend taking another look at the section of the curriculum on partitions. I think that week's homework was much harder than the other ones. Going from the usual course material to more combinatorial thinking was jarring.

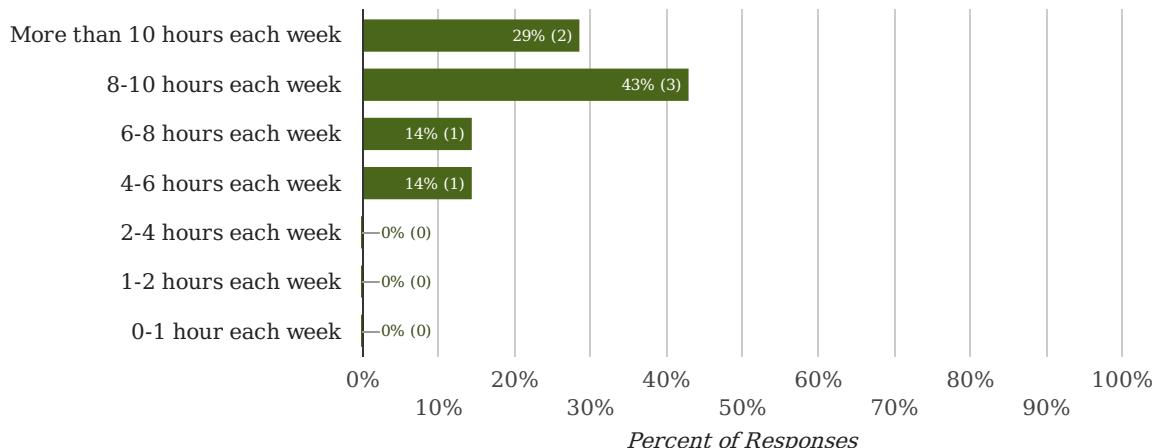
Q: What specific change in the accessibility of the course would help your learning?

Q: Please say more about how none of the teaching elements above need improvement to help your learning.

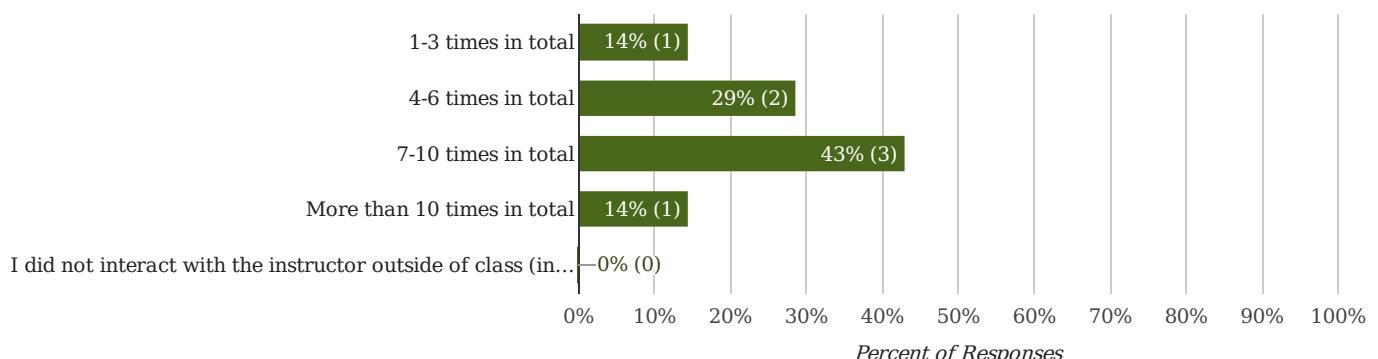
1 Overall, this course was very challenging, that being said, I felt it was taught very well. I felt very welcome and unafraid to ask questions.
2 not really. He's been doing a great job!

Student engagement in their own learning

How many hours per week did you spend on this course (not including any face-to-face class time)?



Approximately how many times did you interact with the instructor outside of class (e.g. by email, office hours)?



COVID Impact

Impacts on my Learning (2 comments)

Q: Describe any challenges you may have faced this session: for example have you experienced technology/connectivity issues, home/personal issues, limited motivation, time management challenges, or distractions that have negatively impacted your learning?

1 no

2 N/A

Is there anything else you would like to say about your learning experience?

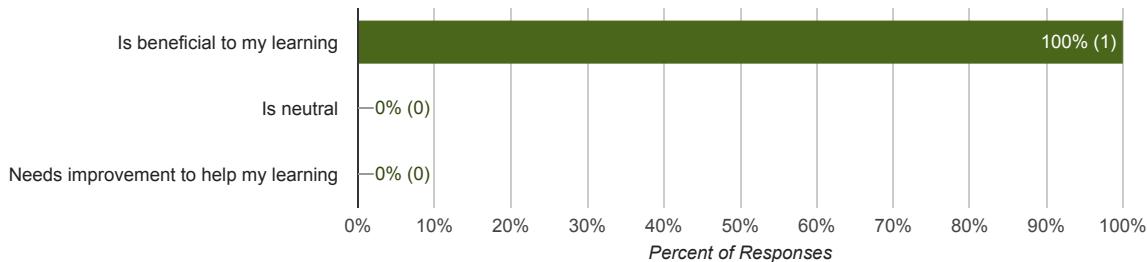
Final Question (2 comments)

Q: What else would you like to say about your learning experience in the course? Please avoid personal comments about the instructor.

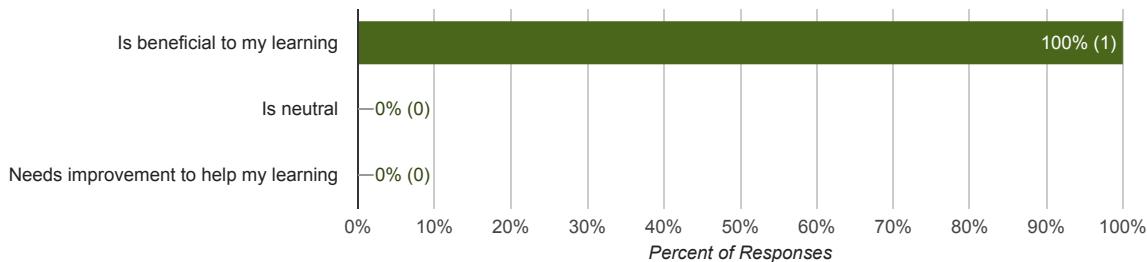
-
- 1 I think I've warmed up to the peer review idea. This second term I've had some good reviews that pointed out when I've cut too many corners in my proofs. I've also had some reviews of lower quality but I think this is unavoidable.
 - 2 Course organization needs improvement, specifically in regards to assignments, group work, and peer review. I suggest reading assignments to help prepare for each week, more time to discuss problems in class and work with peers, and better rubrics and structure for peer reviews. (Perhaps doing them during class so students can receive feedback from instructor so students can receive beneficial feedback.)

Teaching and Learning Elements

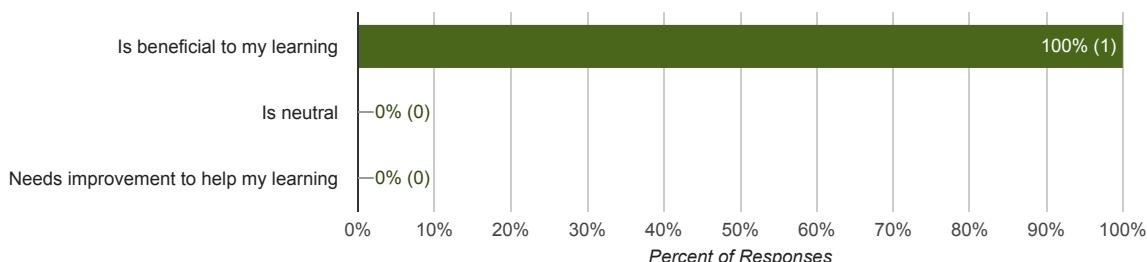
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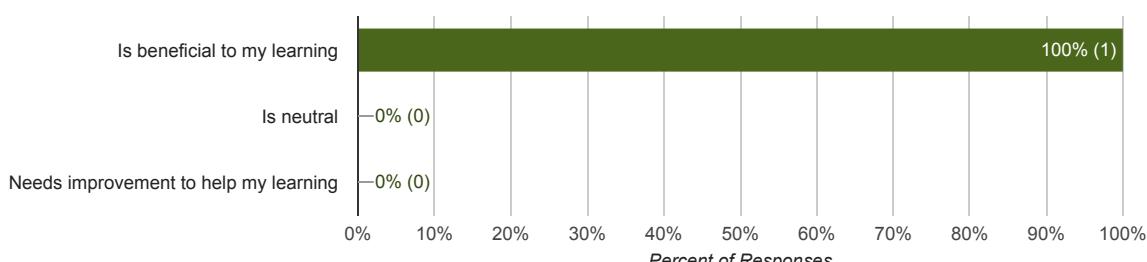
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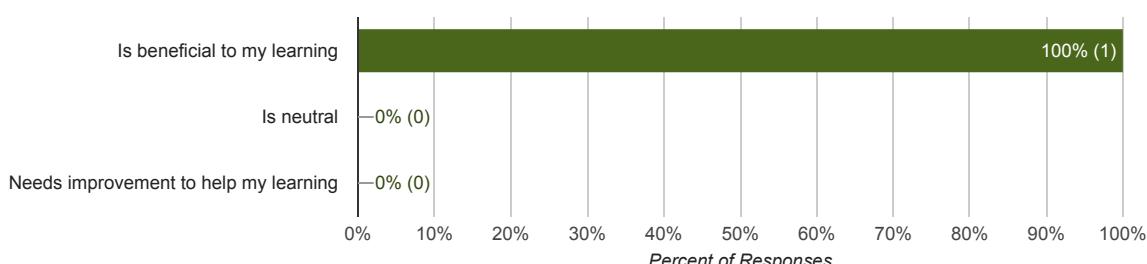
The feedback provided:

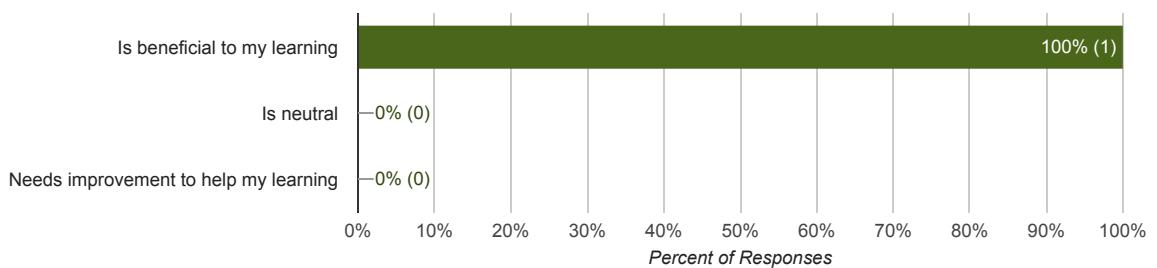
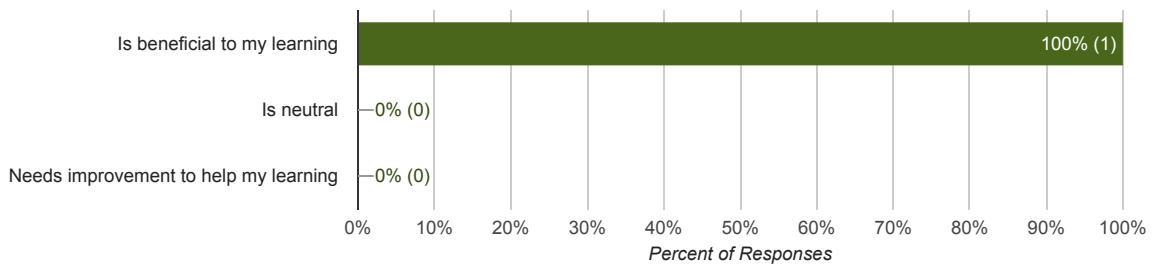
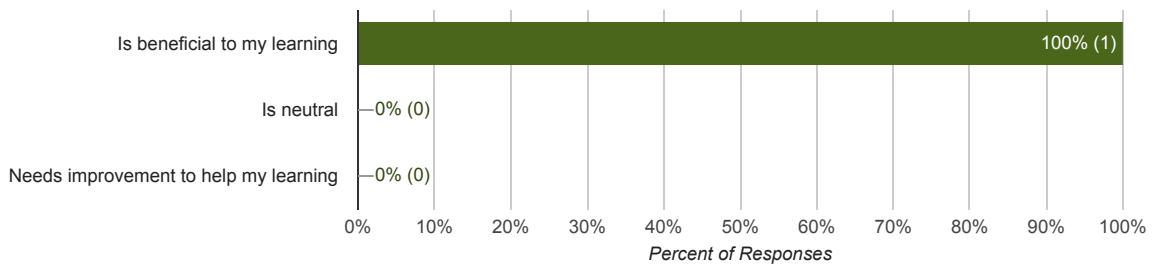
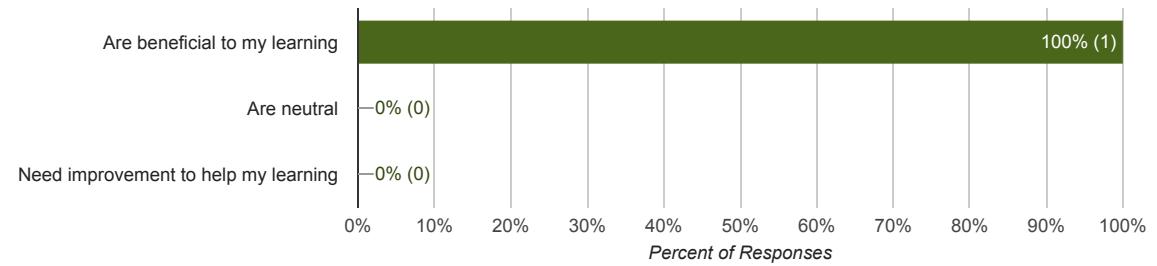
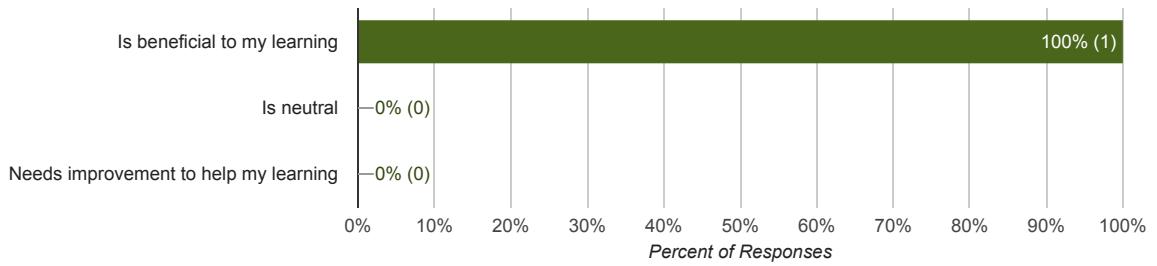


The clarity of assignment instructions and grading:



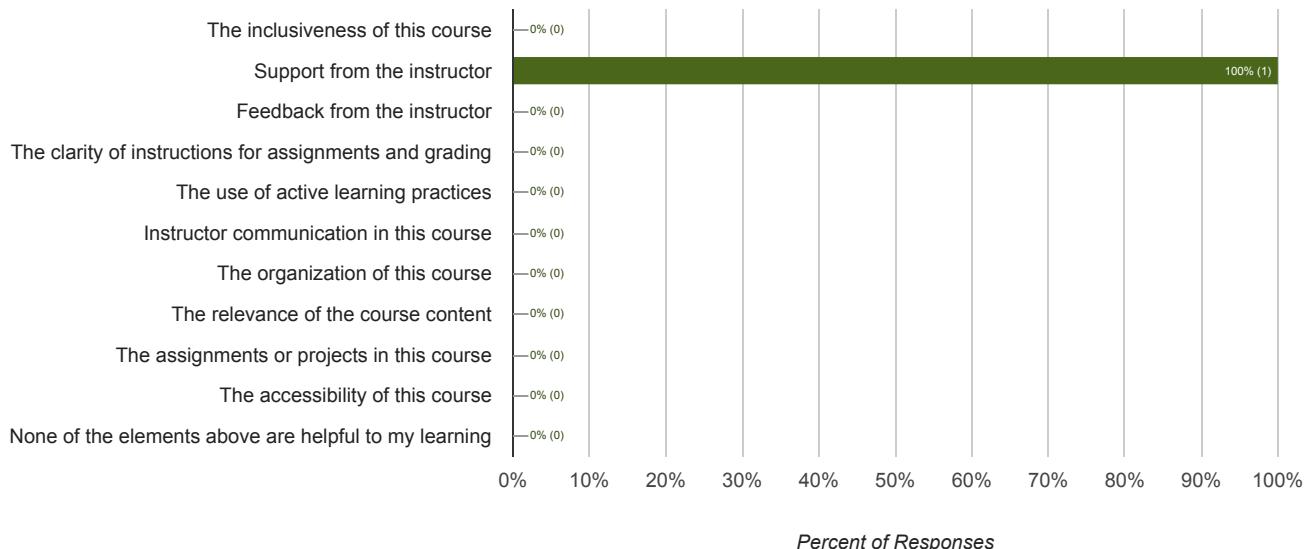
The degree to which the course includes active learning:



Instructor communication:**The organization of the course:****The relevance of the course content:****The assignments or projects in this course:****The accessibility of the course:**

Most Beneficial

Please select the teaching element that has been MOST helpful to your learning, and then provide a detailed written comment about what worked well and why.



Most Beneficial Comments

What's Been MOST Helpful to Your Learning? (1 comments)

Q: What specifically about the inclusiveness of the course helped your learning?

Q: What specifically about the support from the instructor helped your learning?

1 He was really nice and the classroom environment felt really laid back and positive, easy to reach out if I had any questions and very supportive!

Q: What specifically about the level of challenge helped your learning?

Q: What specifically about the feedback helped your learning?

Q: What specifically about the quality of course materials helped your learning?

Q: What specifically about the clarity of instructions helped your learning?

Q: What specifically about the use of active learning helped your learning?

Q: What specifically about the interactions between students helped your learning?

Q: What specifically about instructor communication helped your learning?

Q: What specifically about the organization of this course helped your learning?

Q: What specifically about the relevance of the course content helped your learning?

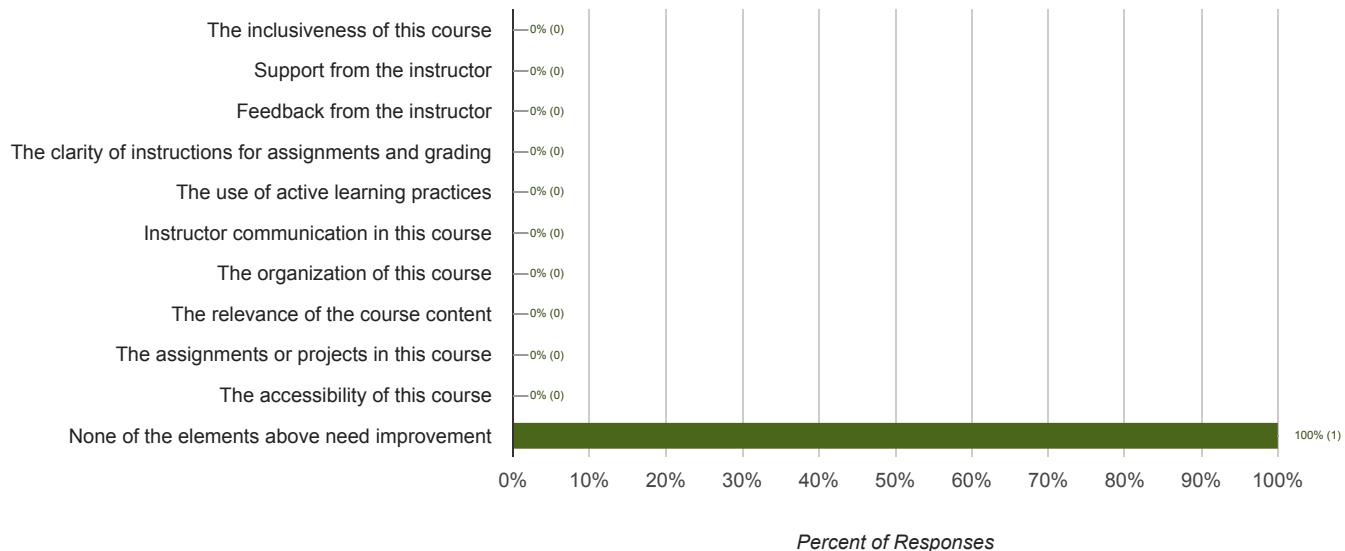
Q: What specifically about the assignments or projects helped your learning?

Q: What specifically about the accessibility of this course helped your learning?

Q: Please say more about how none of the teaching elements above were helpful to your learning.

Most In Need of Improvement

Please select one teaching element that could most use some improvement to help you learn, and then provide a detailed written comment about what specific changes you suggest.



Most In Need of Improvement Comments

What Could MOST Use Some Improvement to Help you Learn? (1 comments)

Q: What specific change in the inclusiveness of the course would help your learning?

Q: What specific change in the support from the instructor would help your learning?

Q: Was the course too hard or too easy? What specific change related to the level of challenge would help your learning?

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Q: What specific change in the use of active learning would help your learning?

Q: What specific change in instructor communication would help your learning?

Q: What specific change in the interactions between students would help your learning?

Q: What specific change in the organization of the course would help your learning?

Q: What specific change in the relevance of the course content would help your learning?

Q: What specific change in the assignments or projects would help your learning?

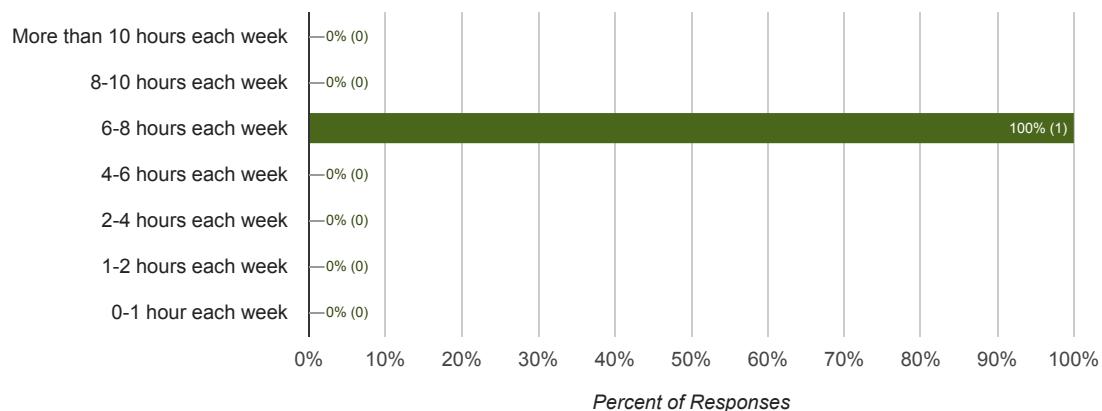
Q: What specific change in the accessibility of the course would help your learning?

Q: Please say more about how none of the teaching elements above need improvement to help your learning.

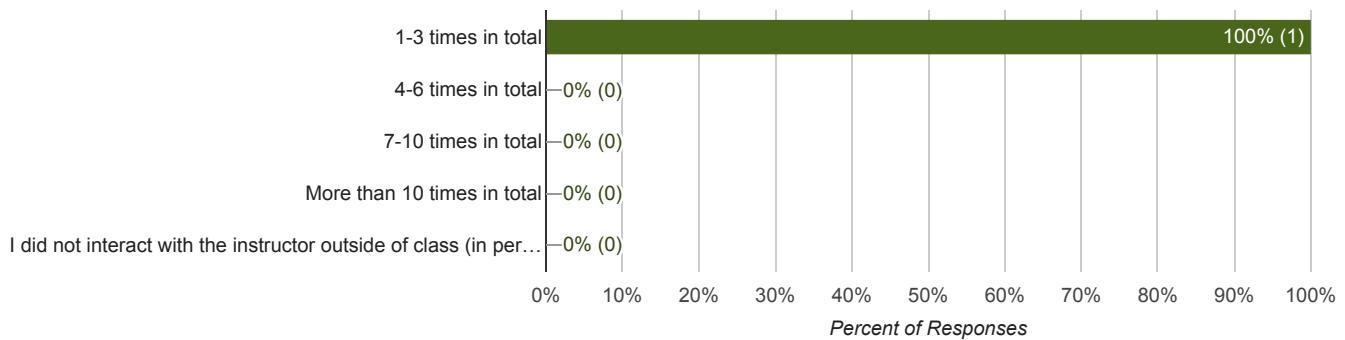
1 Good discussion and nothing I can think to improve on

Student engagement in their own learning

How many hours per week did you spend on this course (not including any face-to-face class time)?



Approximately how many times did you interact with the instructor outside of class (e.g. by email, office hours)?

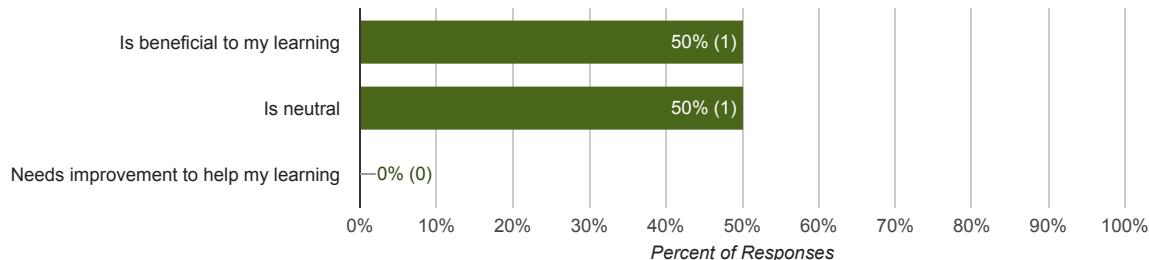


COVID Impact

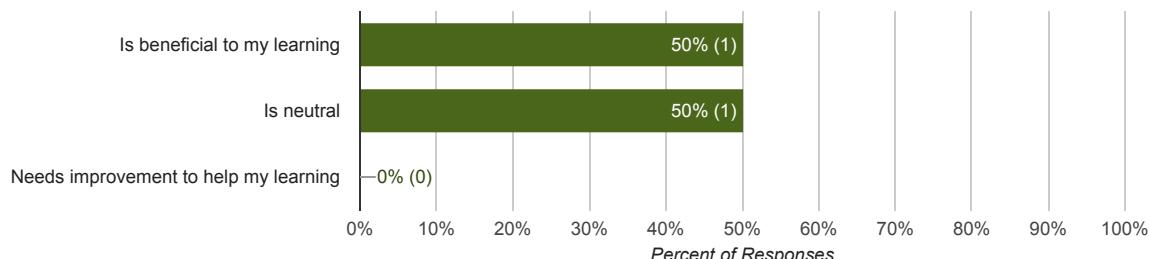
Is there anything else you would like to say about your learning experience?

Teaching and Learning Elements

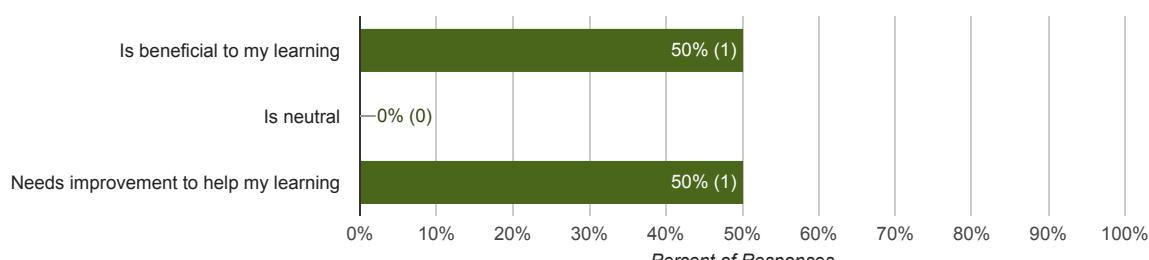
The inclusiveness of this course:



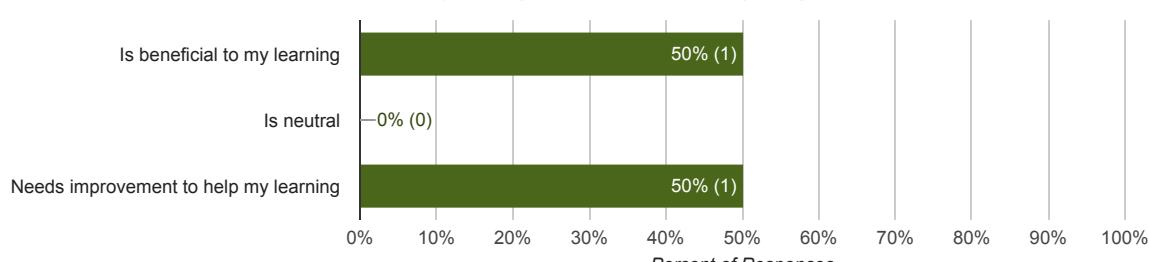
The support from the instructor:



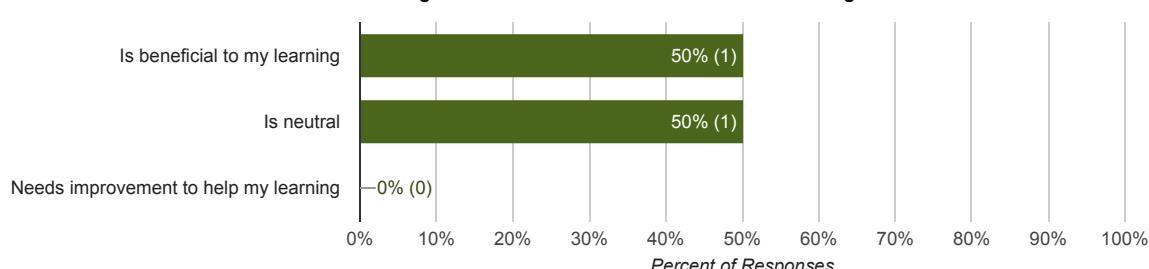
The feedback provided:

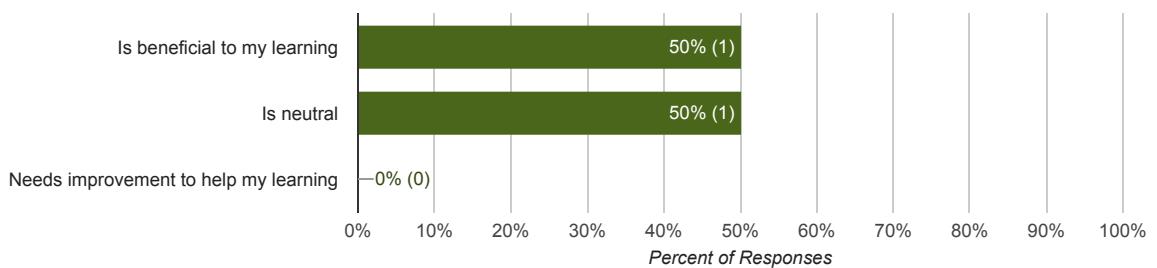
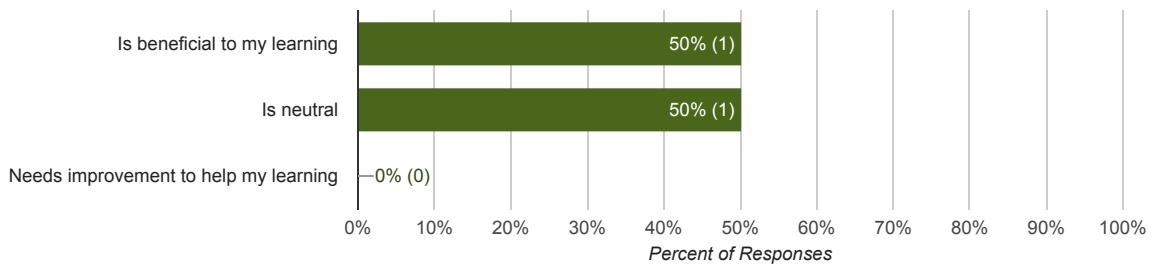
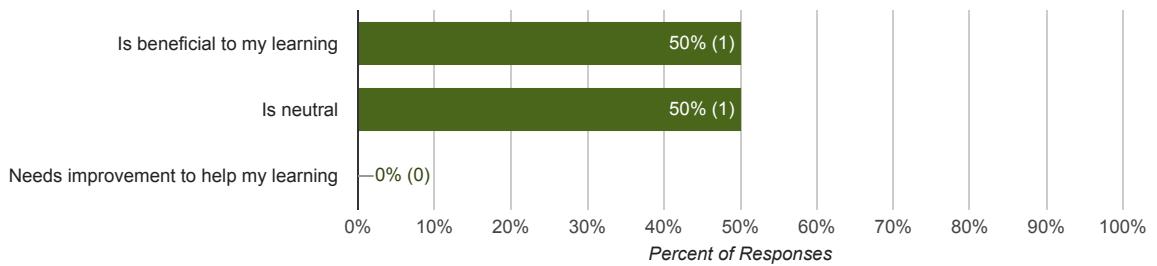
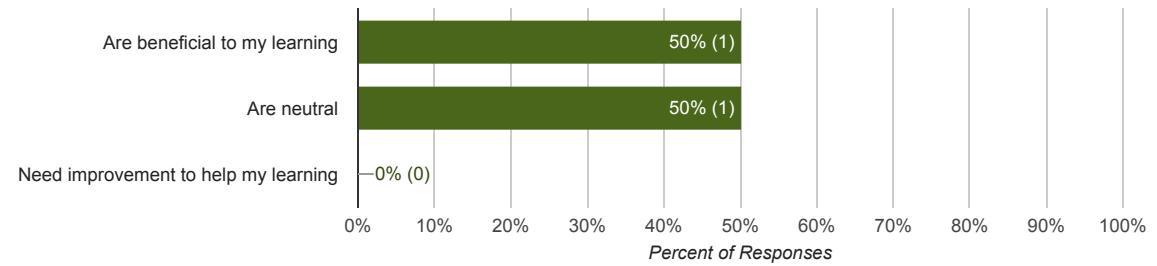
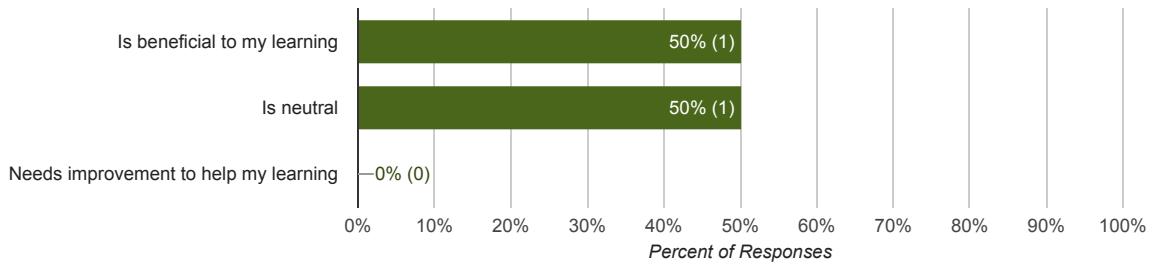


The clarity of assignment instructions and grading:



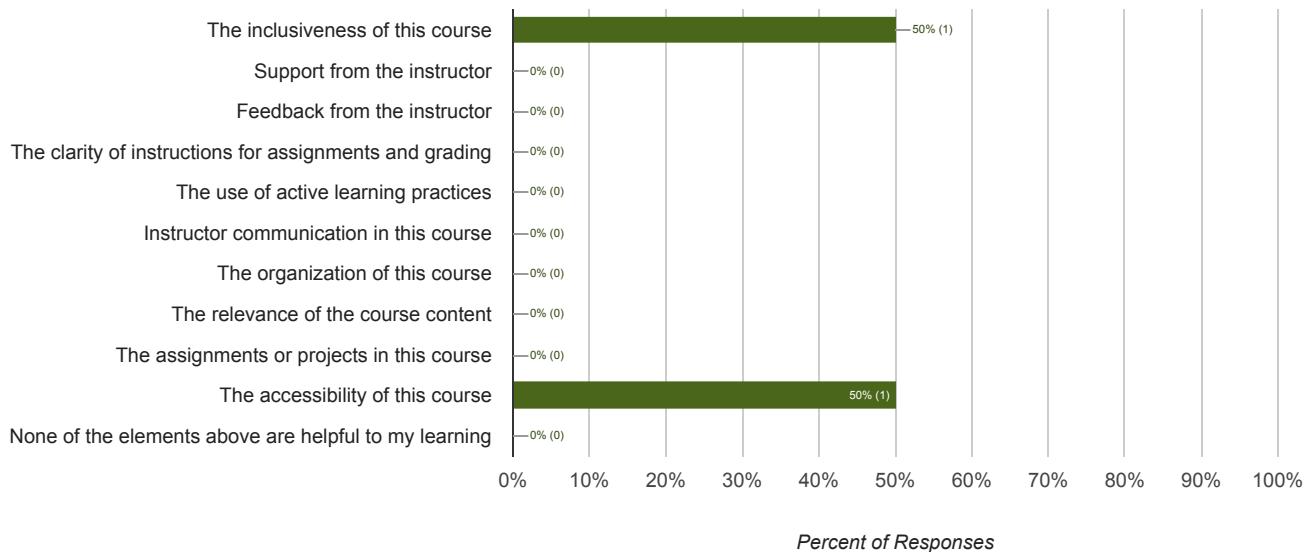
The degree to which the course includes active learning:



Instructor communication:**The organization of the course:****The relevance of the course content:****The assignments or projects in this course:****The accessibility of the course:**

Most Beneficial

Please select the teaching element that has been **MOST** helpful to your learning, and then provide a detailed written comment about what worked well and why.



Most Beneficial Comments

What's Been **MOST** Helpful to Your Learning? (2 comments)

Q: What specifically about the inclusiveness of the course helped your learning?

1 Greg was always very helpful

Q: What specifically about the support from the instructor helped your learning?

Q: What specifically about the level of challenge helped your learning?

Q: What specifically about the feedback helped your learning?

Q: What specifically about the quality of course materials helped your learning?

Q: What specifically about the clarity of instructions helped your learning?

Q: What specifically about the use of active learning helped your learning?

Q: What specifically about the interactions between students helped your learning?

Q: What specifically about instructor communication helped your learning?

Q: What specifically about the organization of this course helped your learning?

Q: What specifically about the relevance of the course content helped your learning?

Q: What specifically about the assignments or projects helped your learning?

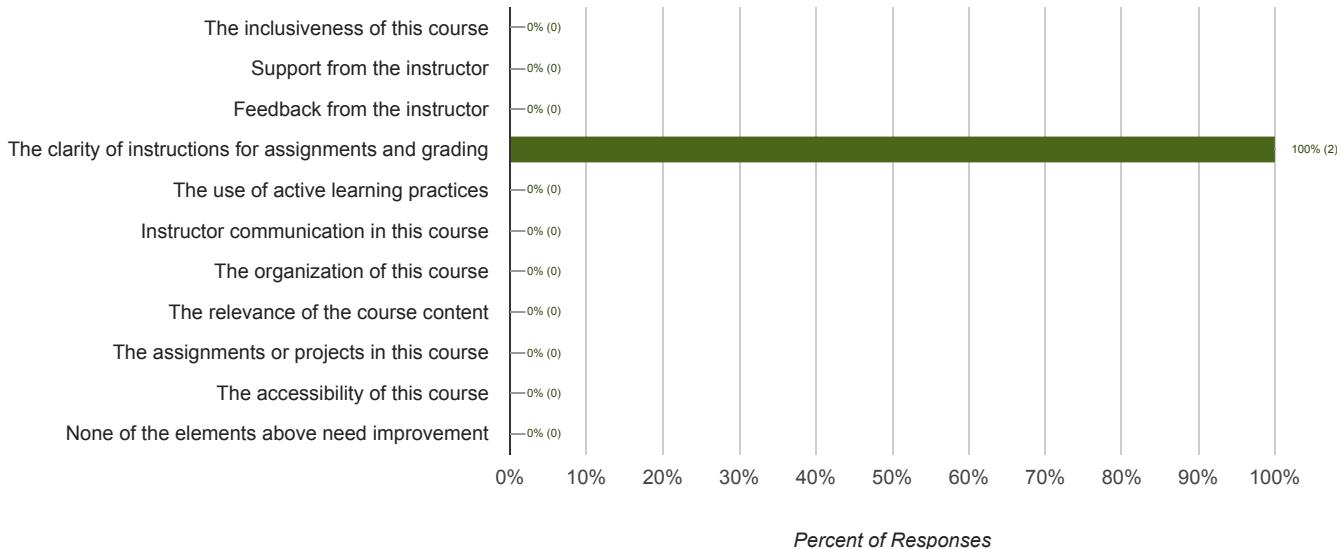
Q: What specifically about the accessibility of this course helped your learning?

1 accessible

Q: Please say more about how none of the teaching elements above were helpful to your learning.

Most In Need of Improvement

Please select one teaching element that could most use some improvement to help you learn, and then provide a detailed written comment about what specific changes you suggest.



Most In Need of Improvement Comments

What Could MOST Use Some Improvement to Help you Learn? (2 comments)

Q: What specific change in the inclusiveness of the course would help your learning?

Q: What specific change in the support from the instructor would help your learning?

Q: Was the course too hard or too easy? What specific change related to the level of challenge would help your learning?

Q: What specific change in the feedback would help your learning?

Q: What specific change in the quality of course materials would help your learning?

Q: What specific change in the clarity of instructions would help your learning?

1 grading was not standardized between GEs

2 The standards were a bit different across classes

Q: What specific change in the use of active learning would help your learning?

Q: What specific change in instructor communication would help your learning?

Q: What specific change in the interactions between students would help your learning?

Q: What specific change in the organization of the course would help your learning?

Q: What specific change in the relevance of the course content would help your learning?

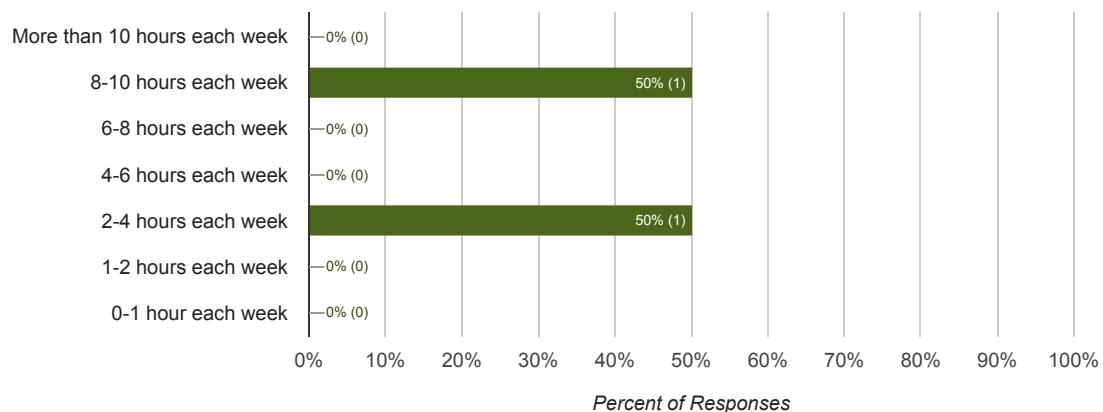
Q: What specific change in the assignments or projects would help your learning?

Q: What specific change in the accessibility of the course would help your learning?

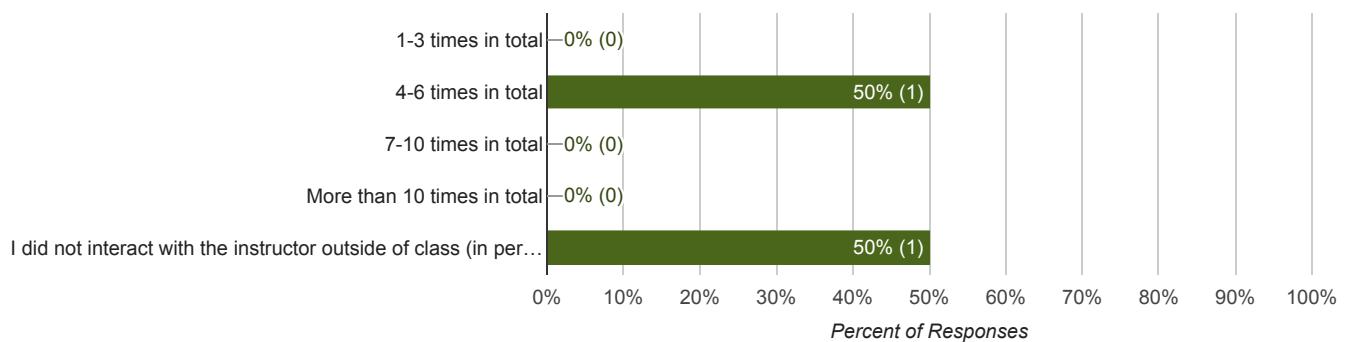
Q: Please say more about how none of the teaching elements above need improvement to help your learning.

Student engagement in their own learning

How many hours per week did you spend on this course (not including any face-to-face class time)?



Approximately how many times did you interact with the instructor outside of class (e.g. by email, office hours)?

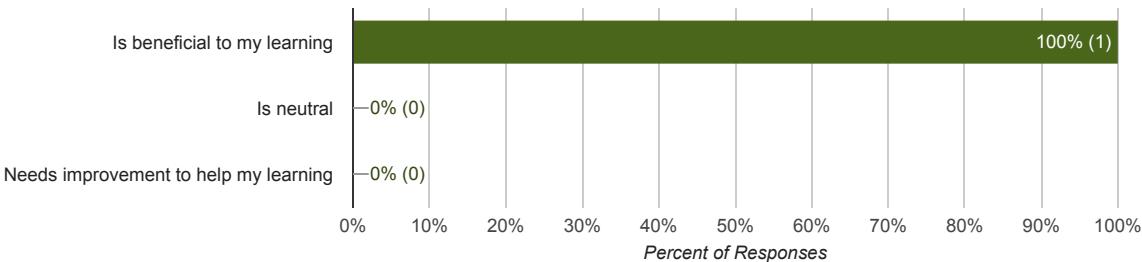


COVID Impact

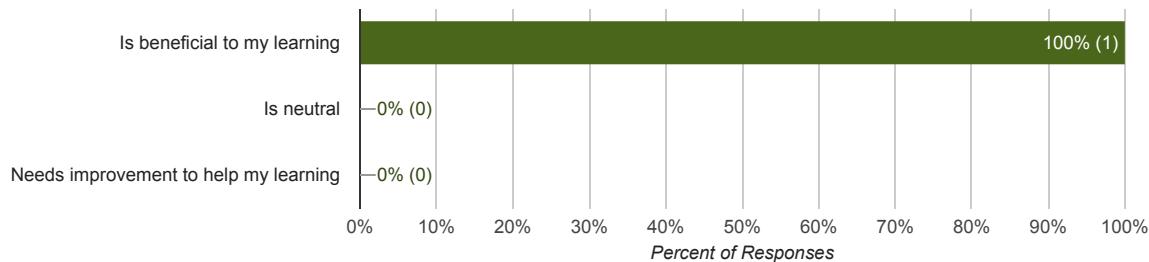
Is there anything else you would like to say about your learning experience?

Teaching and Learning Elements

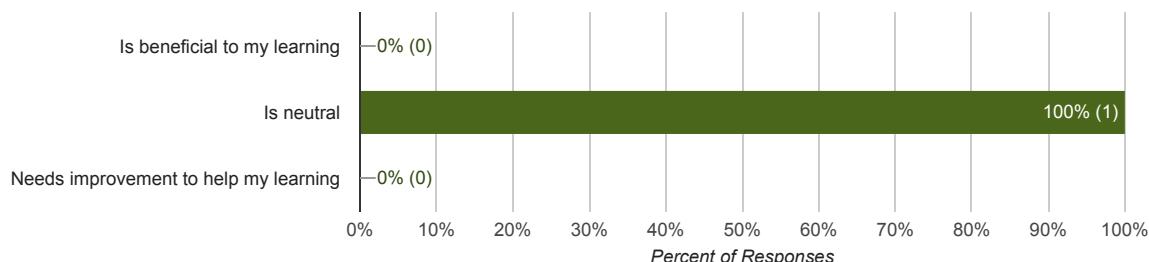
The inclusiveness of this course:



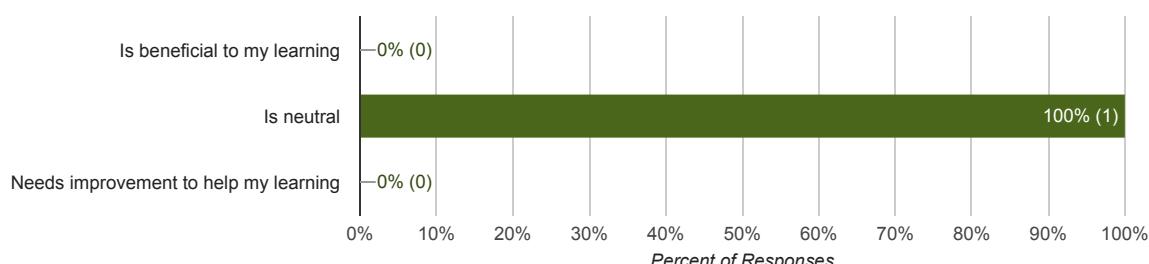
The support from the instructor:



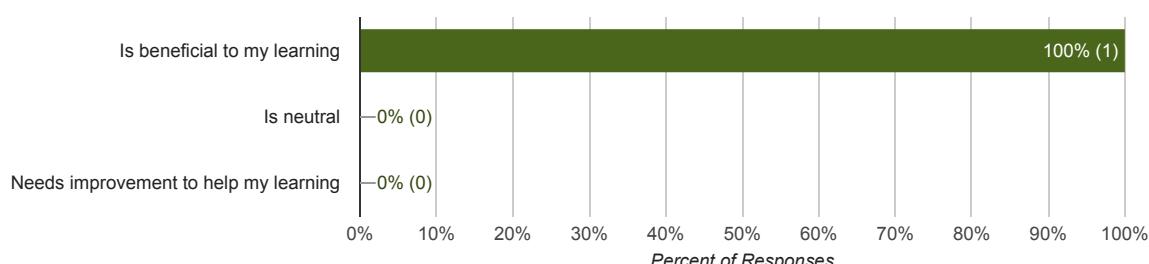
The feedback provided:

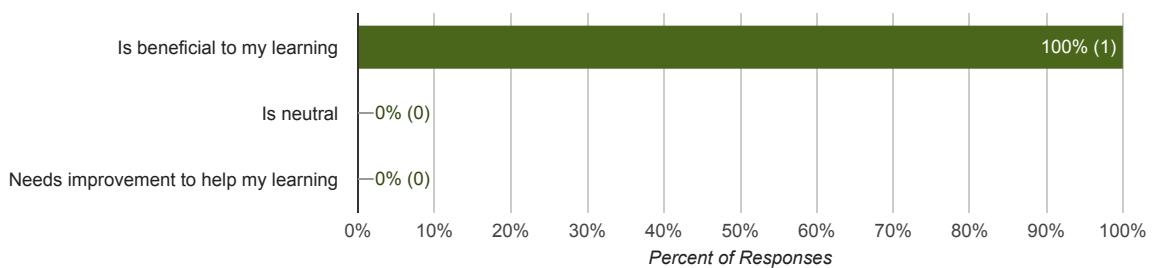
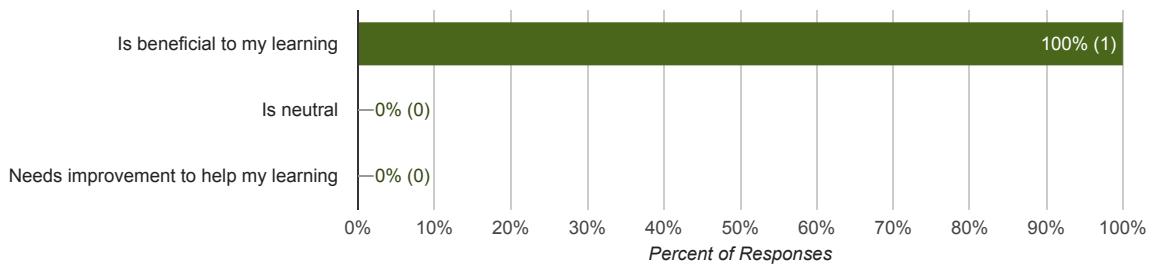
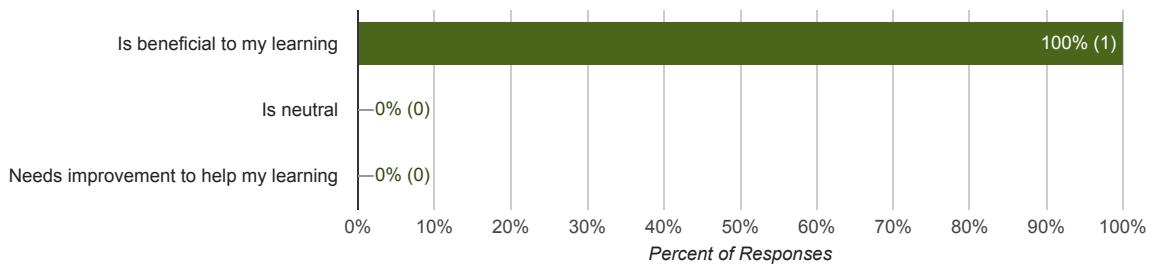
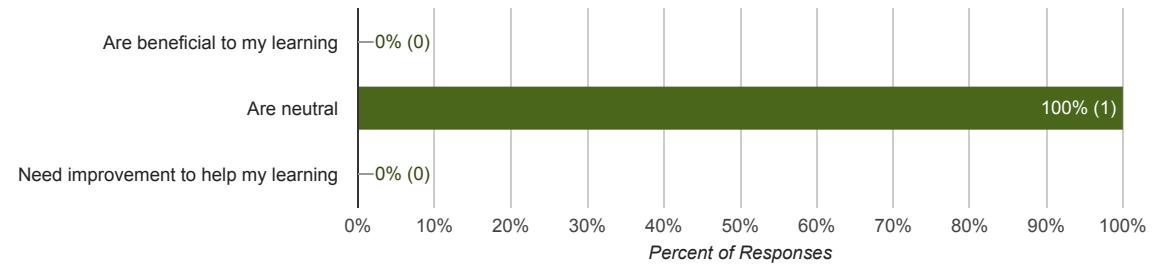
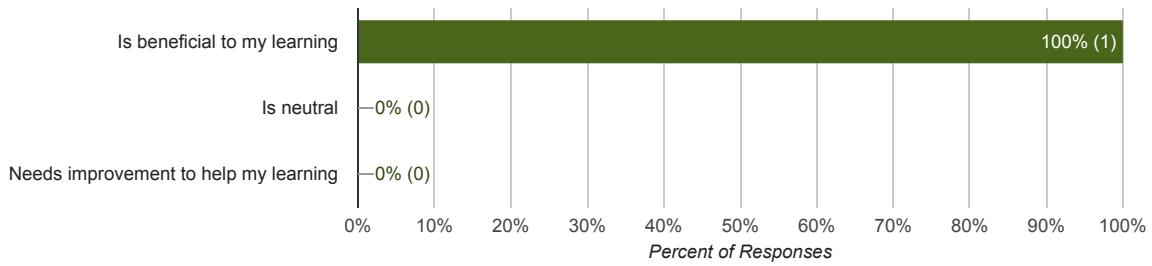


The clarity of assignment instructions and grading:



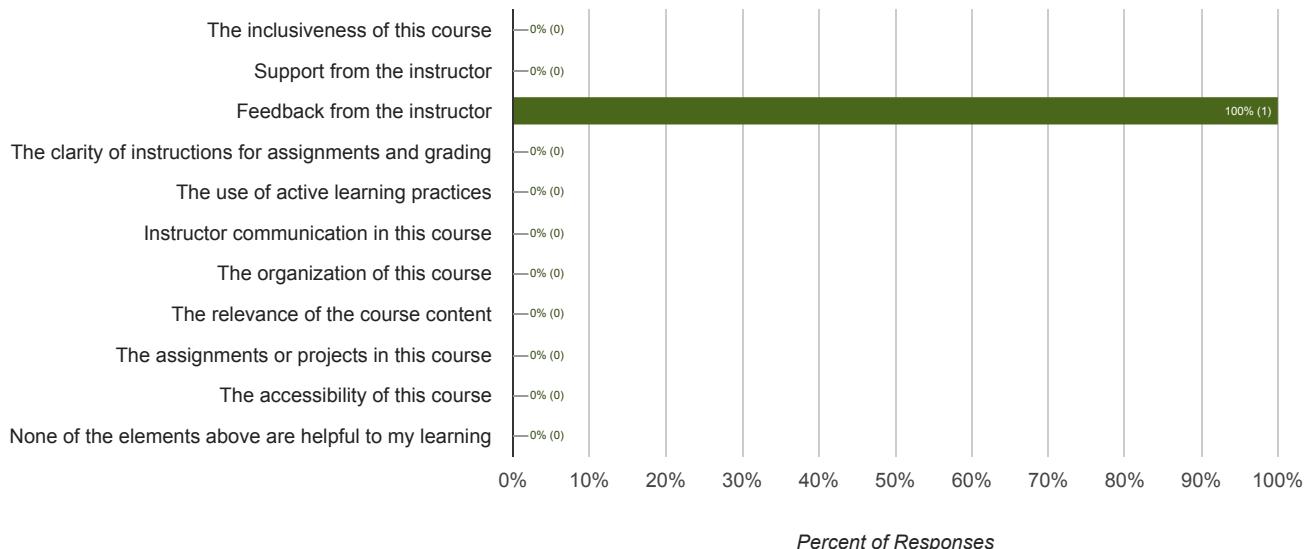
The degree to which the course includes active learning:



Instructor communication:**The organization of the course:****The relevance of the course content:****The assignments or projects in this course:****The accessibility of the course:**

Most Beneficial

Please select the teaching element that has been MOST helpful to your learning, and then provide a detailed written comment about what worked well and why.



Most Beneficial Comments

What's Been MOST Helpful to Your Learning? (1 comments)

Q: What specifically about the inclusiveness of the course helped your learning?

Q: What specifically about the support from the instructor helped your learning?

Q: What specifically about the level of challenge helped your learning?

Q: What specifically about the feedback helped your learning?

1 The instructor gave great feedback. Never answered a question poorly.

Q: What specifically about the quality of course materials helped your learning?

Q: What specifically about the clarity of instructions helped your learning?

Q: What specifically about the use of active learning helped your learning?

Q: What specifically about the interactions between students helped your learning?

Q: What specifically about instructor communication helped your learning?

Q: What specifically about the organization of this course helped your learning?

Q: What specifically about the relevance of the course content helped your learning?

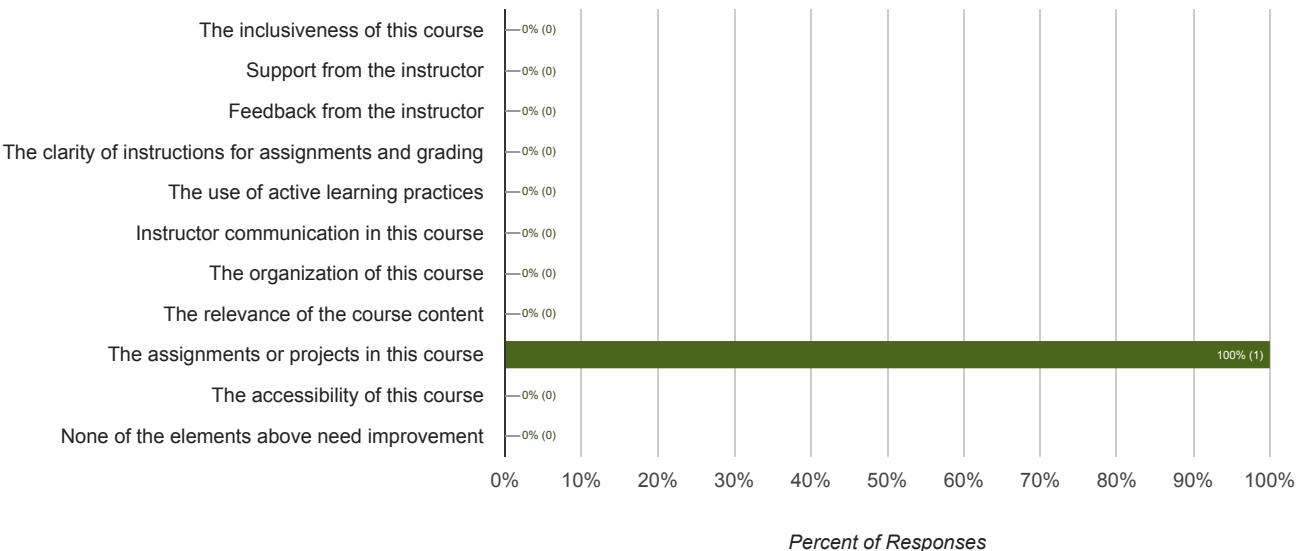
Q: What specifically about the assignments or projects helped your learning?

Q: What specifically about the accessibility of this course helped your learning?

Q: Please say more about how none of the teaching elements above were helpful to your learning.

Most In Need of Improvement

Please select one teaching element that could most use some improvement to help you learn, and then provide a detailed written comment about what specific changes you suggest.



Most In Need of Improvement Comments

What Could MOST Use Some Improvement to Help you Learn? (1 comments)

Q: What specific change in the inclusiveness of the course would help your learning?

Q: What specific change in the support from the instructor would help your learning?

Q: Was the course too hard or too easy? What specific change related to the level of challenge would help your learning?

Q: What specific change in the feedback would help your learning?

Q: What specific change in the quality of course materials would help your learning?

Q: What specific change in the clarity of instructions would help your learning?

Q: What specific change in the use of active learning would help your learning?

Q: What specific change in instructor communication would help your learning?

Q: What specific change in the interactions between students would help your learning?

Q: What specific change in the organization of the course would help your learning?

Q: What specific change in the relevance of the course content would help your learning?

Q: What specific change in the assignments or projects would help your learning?

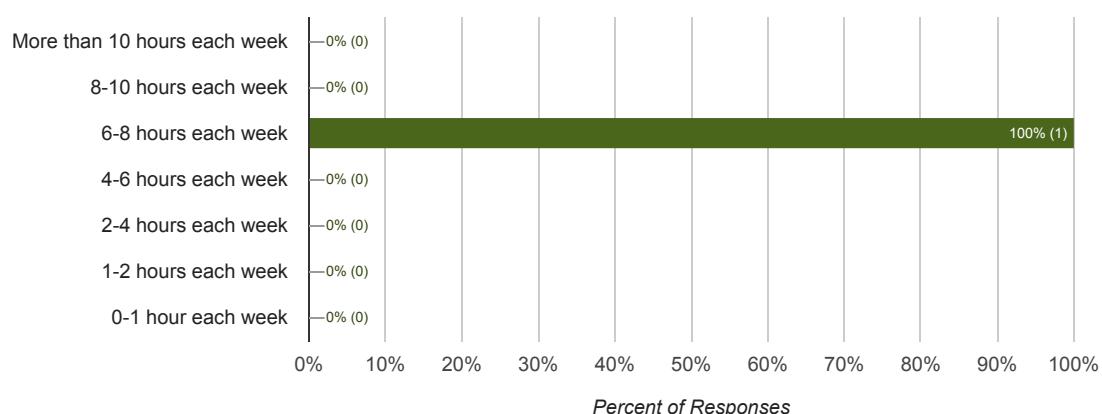
1 Some of the problems seem a bit too complicated, and they seem to be testing your endurance to go through 5 steps without making a mistake.

Q: What specific change in the accessibility of the course would help your learning?

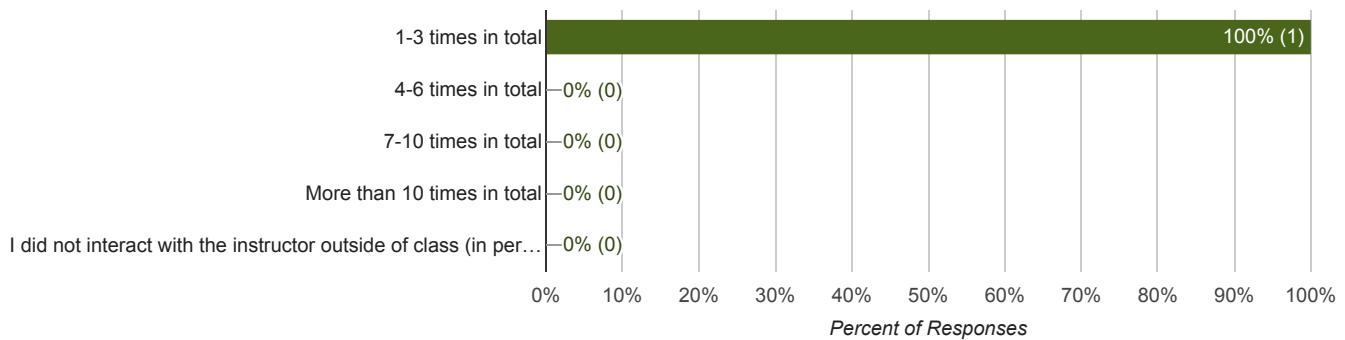
Q: Please say more about how none of the teaching elements above need improvement to help your learning.

Student engagement in their own learning

How many hours per week did you spend on this course (not including any face-to-face class time)?



Approximately how many times did you interact with the instructor outside of class (e.g. by email, office hours)?



COVID Impact

Is there anything else you would like to say about your learning experience?

Teaching and Learning Elements

Most Beneficial

Most Beneficial Comments

Most In Need of Improvement

Most In Need of Improvement Comments

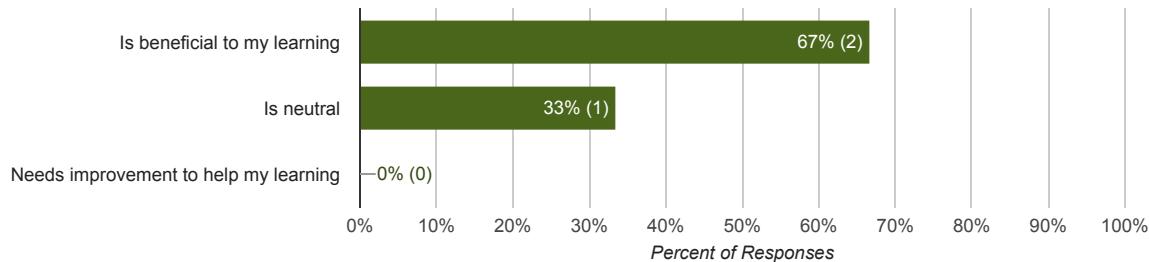
Student engagement in their own learning

COVID Impact

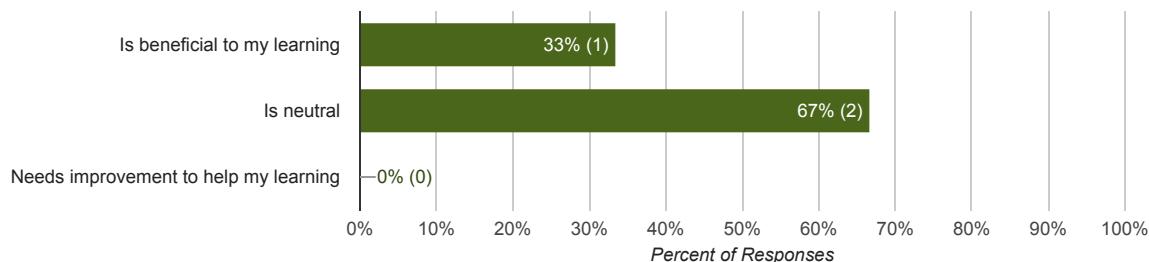
Is there anything else you would like to say about your learning experience?

Teaching and Learning Elements

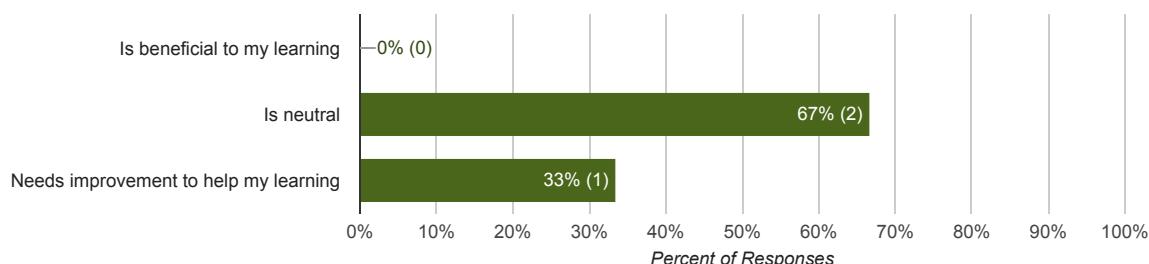
The inclusiveness of this course:



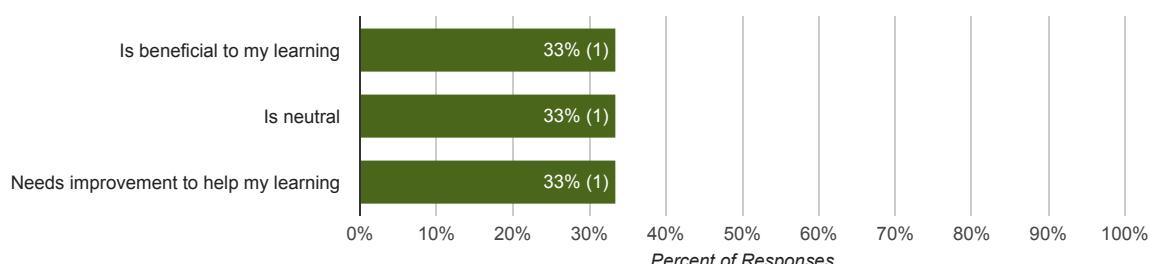
The support from the instructor:



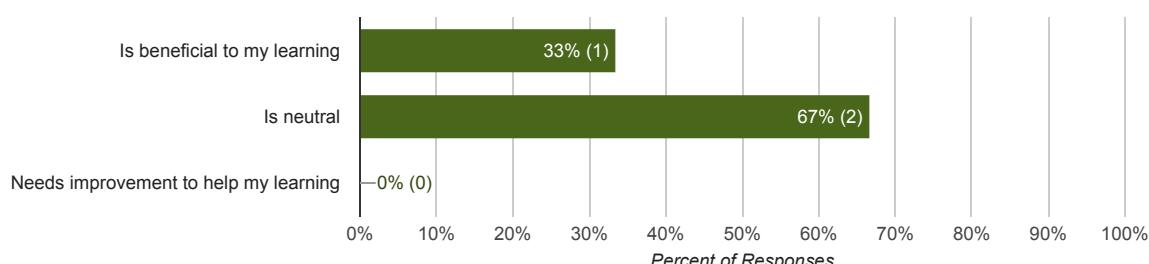
The feedback provided:

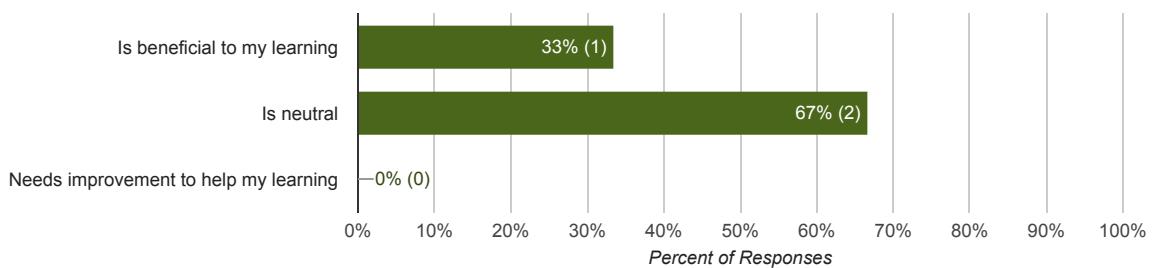
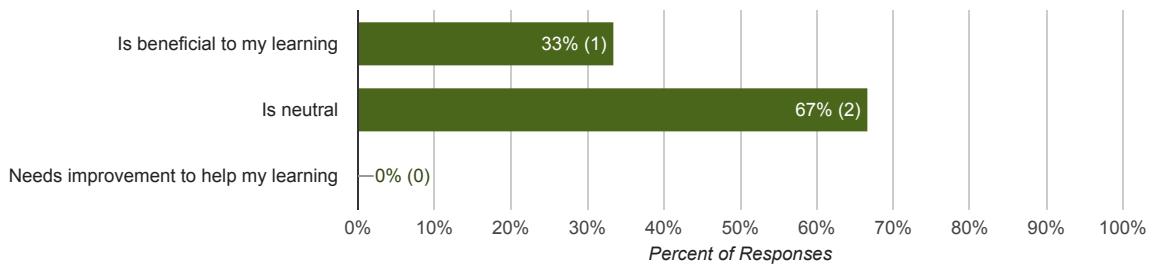
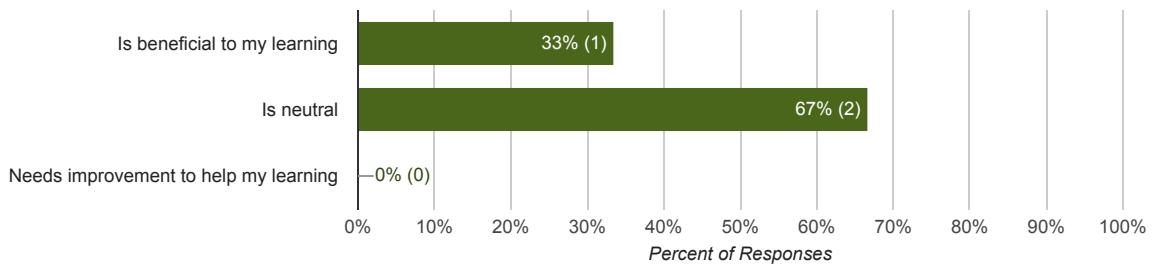
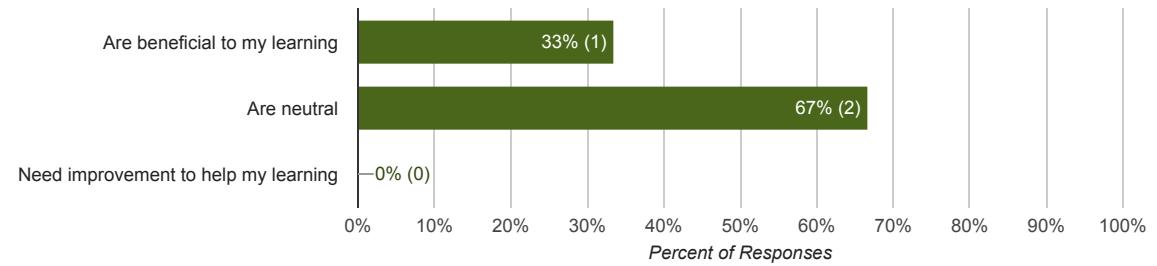
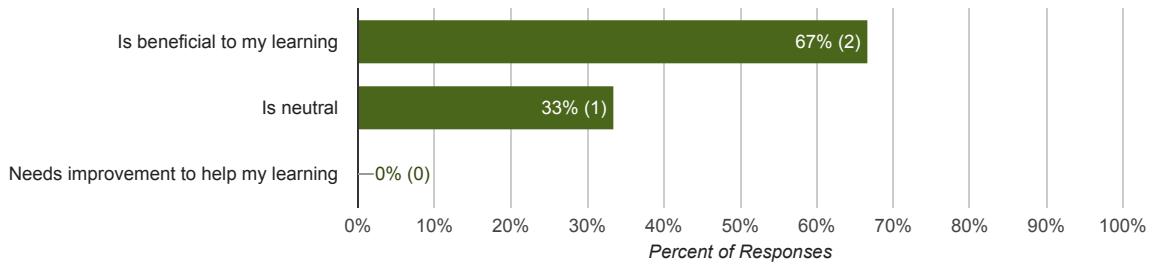


The clarity of assignment instructions and grading:



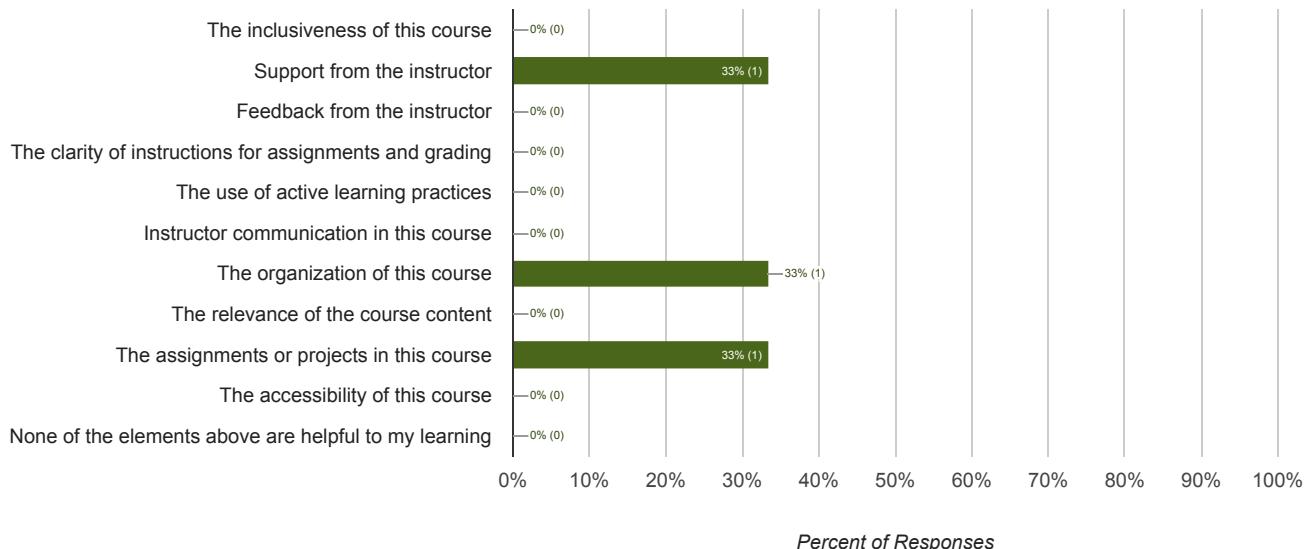
The degree to which the course includes active learning:



Instructor communication:**The organization of the course:****The relevance of the course content:****The assignments or projects in this course:****The accessibility of the course:**

Most Beneficial

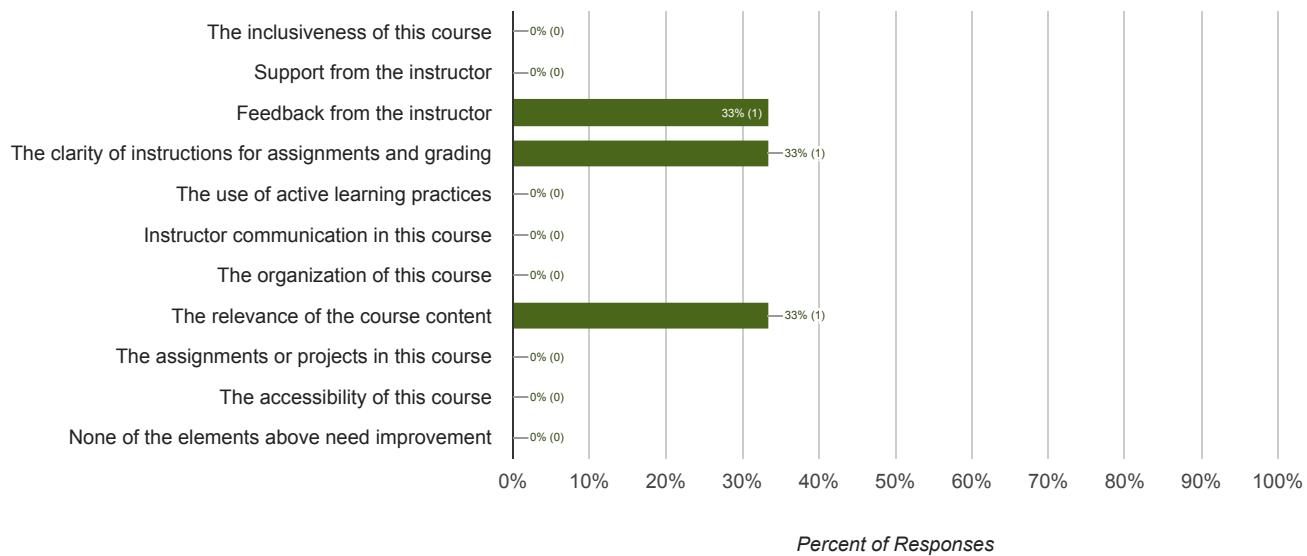
Please select the teaching element that has been MOST helpful to your learning, and then provide a detailed written comment about what worked well and why.



Most Beneficial Comments

Most In Need of Improvement

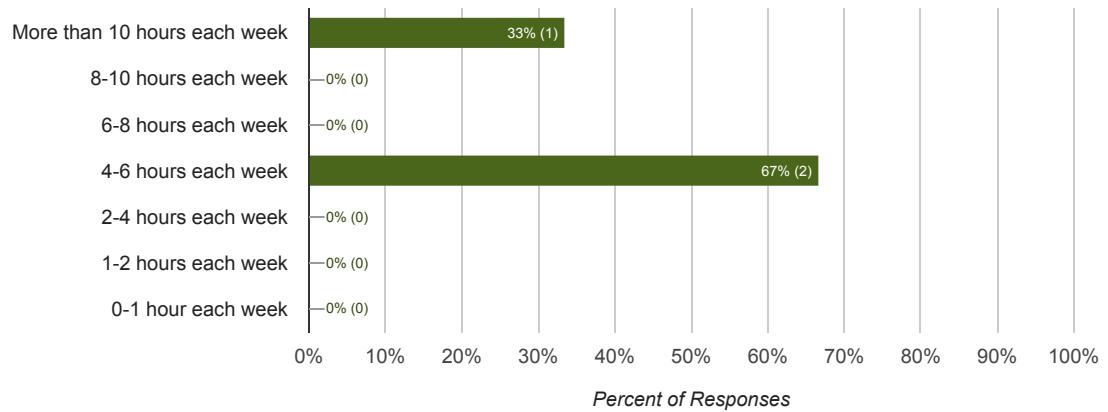
Please select one teaching element that could most use some improvement to help you learn, and then provide a detailed written comment about what specific changes you suggest.



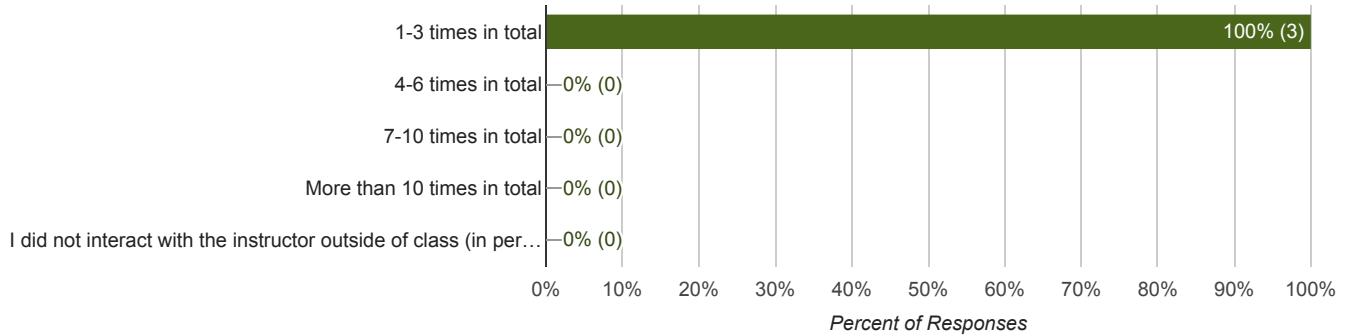
Most In Need of Improvement Comments

Student engagement in their own learning

How many hours per week did you spend on this course (not including any face-to-face class time)?



Approximately how many times did you interact with the instructor outside of class (e.g. by email, office hours)?

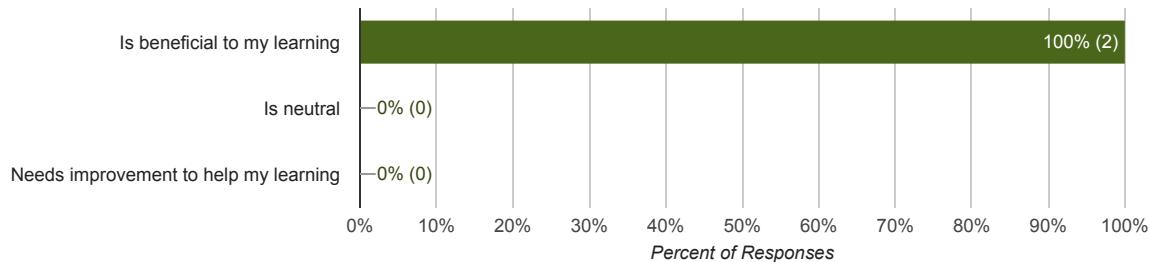


COVID Impact

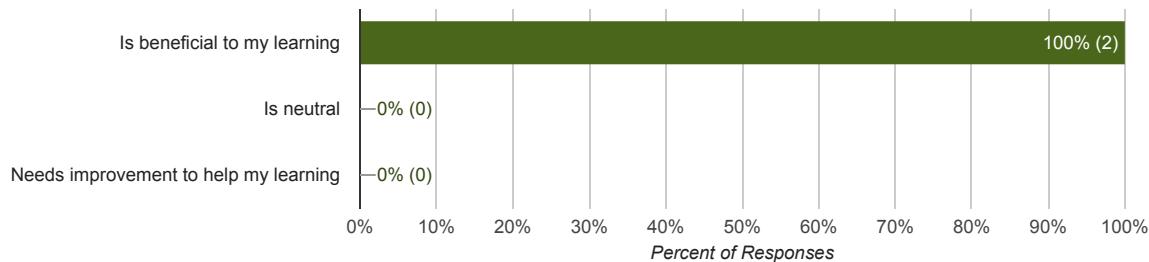
Is there anything else you would like to say about your learning experience?

Teaching and Learning Elements

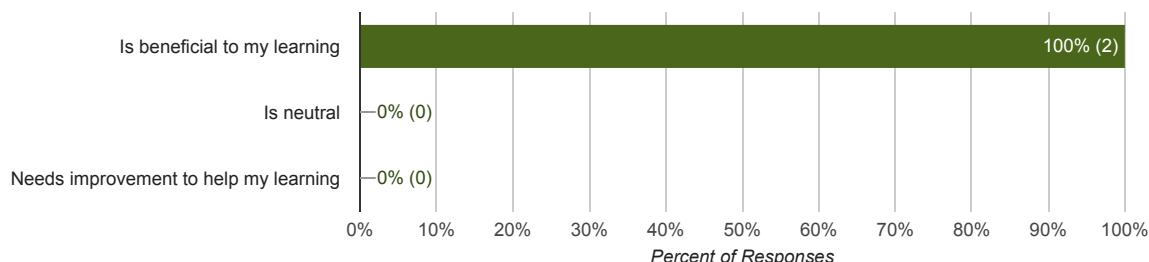
The inclusiveness of this course:



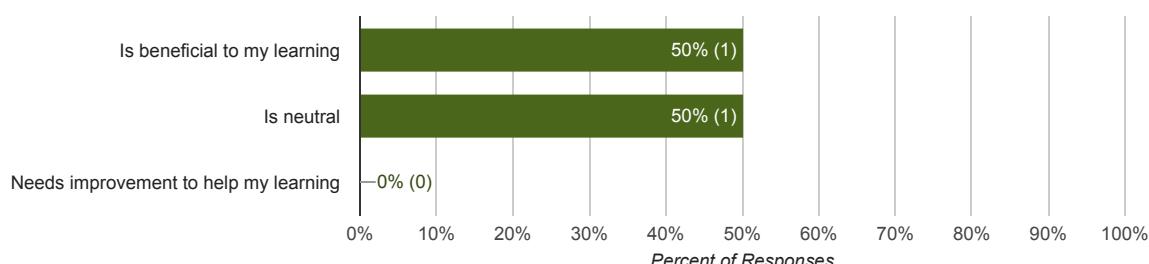
The support from the instructor:



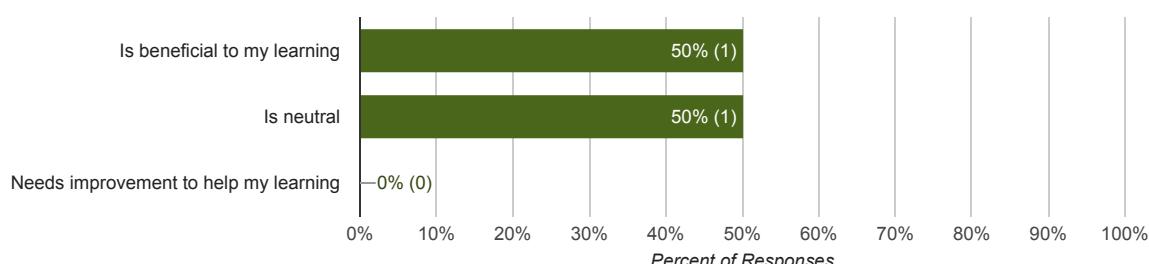
The feedback provided:

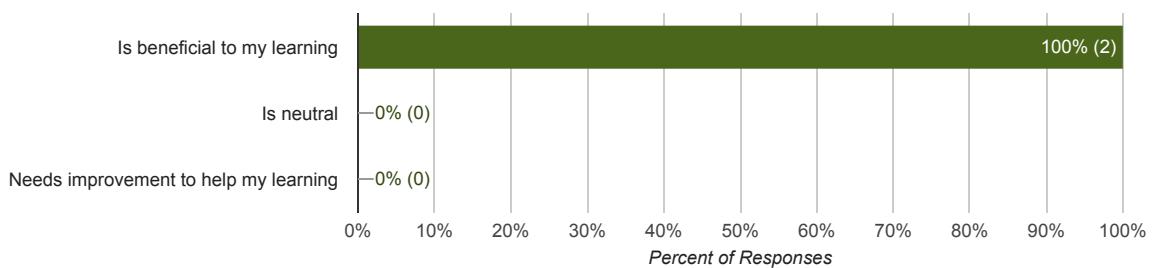
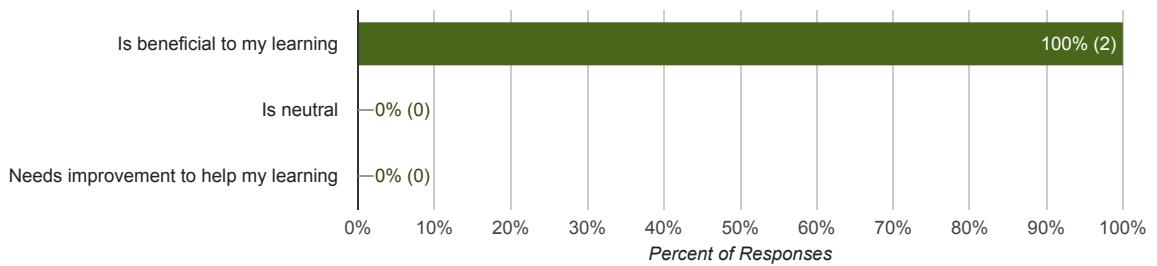
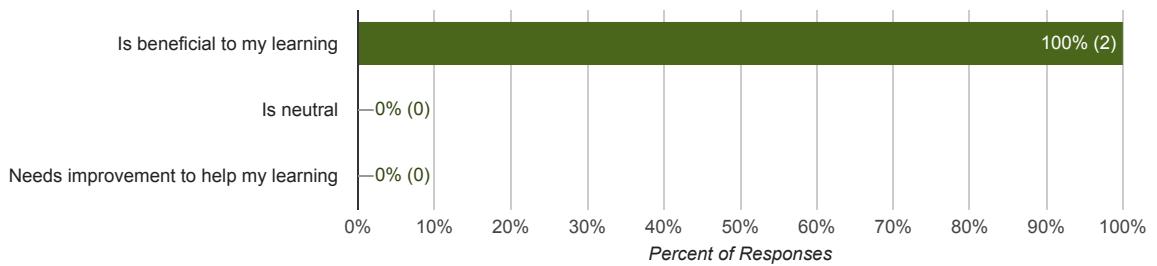
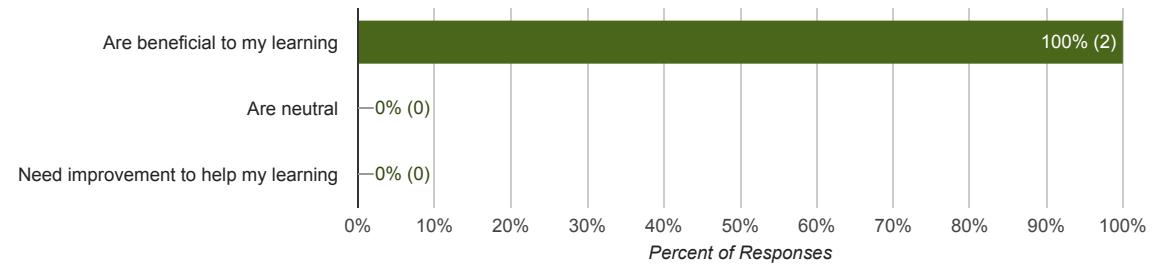
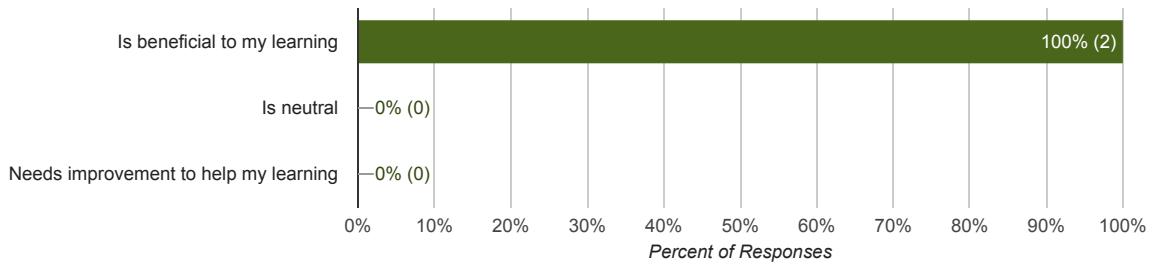


The clarity of assignment instructions and grading:



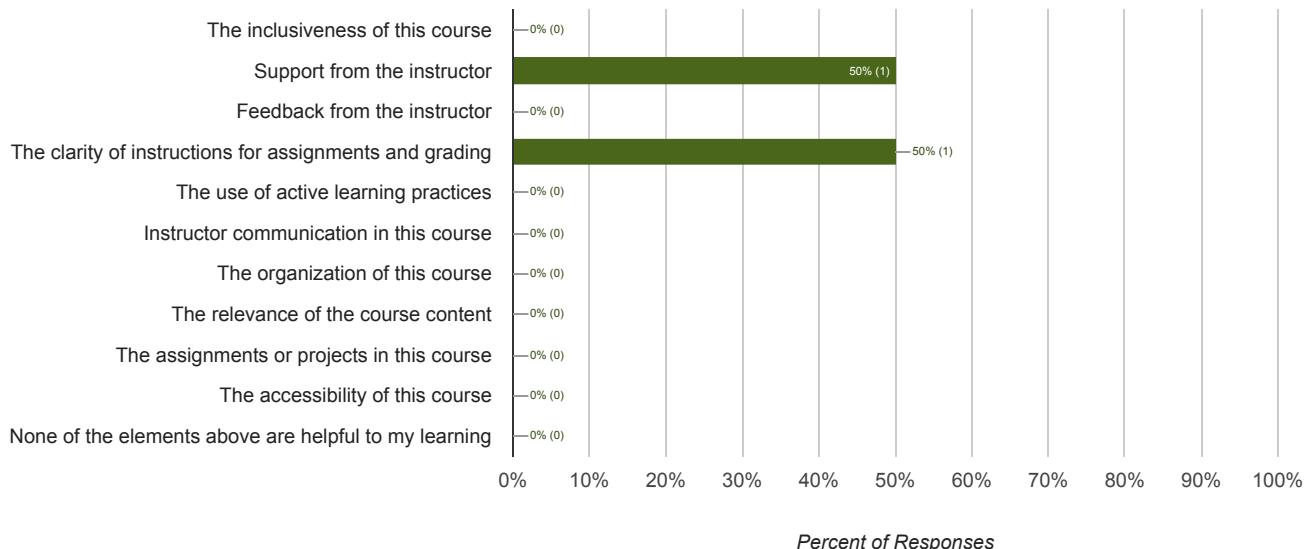
The degree to which the course includes active learning:



Instructor communication:**The organization of the course:****The relevance of the course content:****The assignments or projects in this course:****The accessibility of the course:**

Most Beneficial

Please select the teaching element that has been **MOST** helpful to your learning, and then provide a detailed written comment about what worked well and why.



Most Beneficial Comments

What's Been **MOST** Helpful to Your Learning? (2 comments)

Q: What specifically about the inclusiveness of the course helped your learning?

Q: What specifically about the support from the instructor helped your learning?

1 He was a very great teacher and was very good at explaining and helping everyone during discussion.

Q: What specifically about the level of challenge helped your learning?

Q: What specifically about the feedback helped your learning?

Q: What specifically about the quality of course materials helped your learning?

Q: What specifically about the clarity of instructions helped your learning?

1 We had two types of assignments in this class and were given specific amounts of time in class to finish them and we could work on them outside of class if needed.

Q: What specifically about the use of active learning helped your learning?

Q: What specifically about the interactions between students helped your learning?

Q: What specifically about instructor communication helped your learning?

Q: What specifically about the organization of this course helped your learning?

Q: What specifically about the relevance of the course content helped your learning?

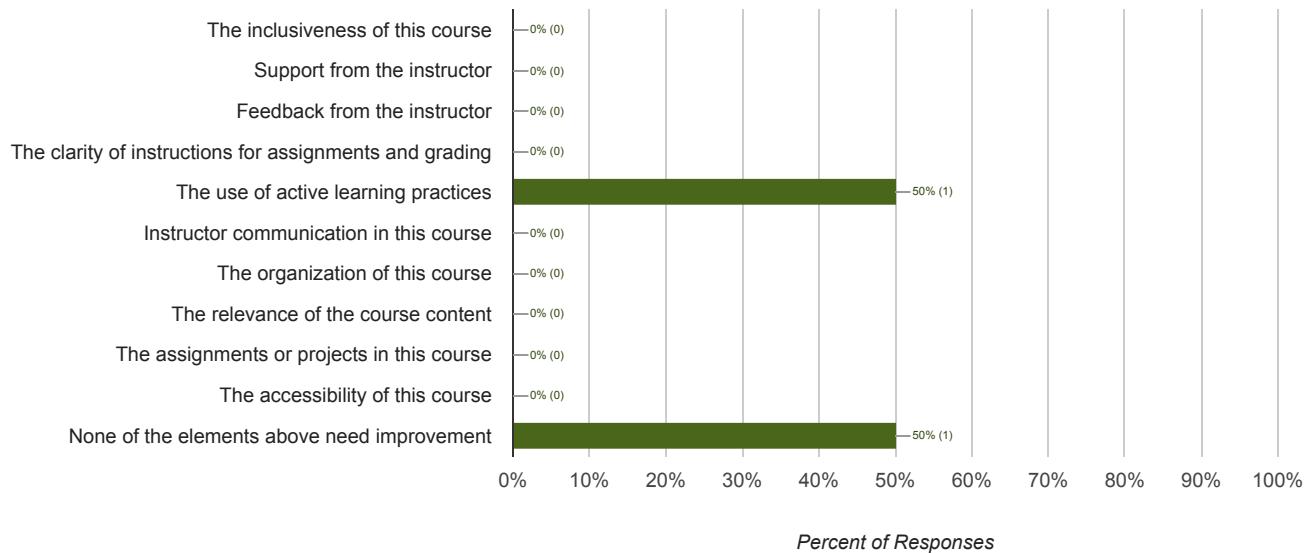
Q: What specifically about the assignments or projects helped your learning?

Q: What specifically about the accessibility of this course helped your learning?

Q: Please say more about how none of the teaching elements above were helpful to your learning.

Most In Need of Improvement

Please select one teaching element that could most use some improvement to help you learn, and then provide a detailed written comment about what specific changes you suggest.



Most In Need of Improvement Comments

What Could MOST Use Some Improvement to Help you Learn? (2 comments)

Q: What specific change in the inclusiveness of the course would help your learning?

Q: What specific change in the support from the instructor would help your learning?

Q: Was the course too hard or too easy? What specific change related to the level of challenge would help your learning?

Q: What specific change in the feedback would help your learning?

Q: What specific change in the quality of course materials would help your learning?

Q: What specific change in the clarity of instructions would help your learning?

Q: What specific change in the use of active learning would help your learning?

1 There was not much discussion everyone was made to work on their own stuff only talking to the teachers if they had questions.

Q: What specific change in instructor communication would help your learning?

Q: What specific change in the interactions between students would help your learning?

Q: What specific change in the organization of the course would help your learning?

Q: What specific change in the relevance of the course content would help your learning?

Q: What specific change in the assignments or projects would help your learning?

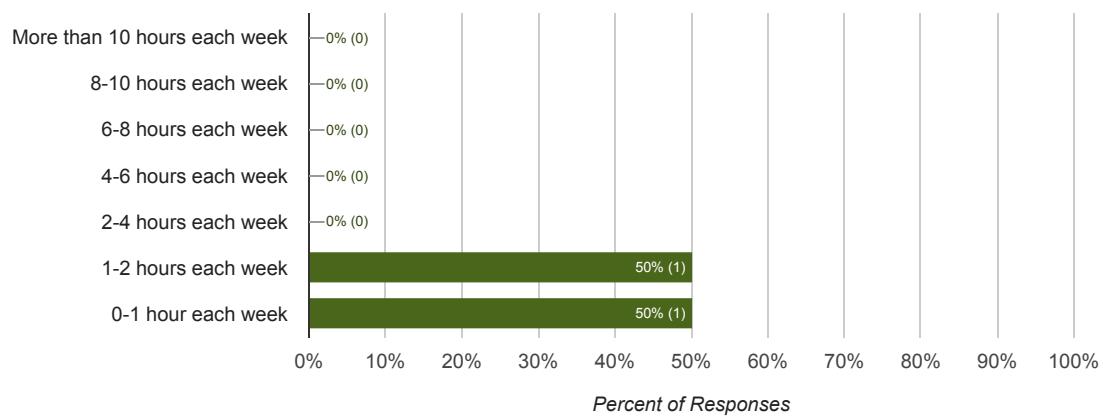
Q: What specific change in the accessibility of the course would help your learning?

Q: Please say more about how none of the teaching elements above need improvement to help your learning.

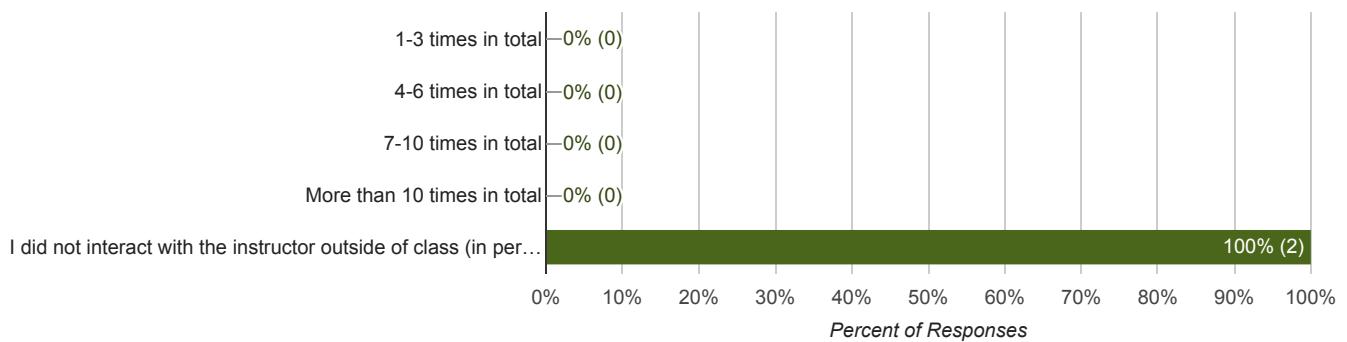
1 He doesn't need to do any improving on any of the above topics.

Student engagement in their own learning

How many hours per week did you spend on this course (not including any face-to-face class time)?



Approximately how many times did you interact with the instructor outside of class (e.g. by email, office hours)?



COVID Impact

Is there anything else you would like to say about your learning experience?

Project Title: 2023 Fall Course Survey

Courses Audience: 95
Responses Received: 34
Response Ratio: 35.8%

Report Comments

The purpose of the University of Calgary Universal Student Ratings of Instruction (USRI) is to provide course instructors information they can use to enhance their teaching, provide students information that can help them in course selection, and information for academic administrators responsible for the assessment of teaching. It should also be recognized that the rating scores can be affected by factors that are not related to teaching and learning such as the identity of the course instructor, class size and the course topic and therefore should not be used independently to assess teaching quality. The information that the ratings provide and some of their limitations are discussed in more detail below.

Students, course instructors, and administrators are strongly encouraged to review the [GFC USRI document](#) for an understanding of the policies and guidelines that apply to use of these ratings. Information on how to use student feedback responsibly can be found in the [Making Sense of Student Feedback](#) resource. Course instructors and academic leaders are encouraged to use this resource as a guide when reviewing student feedback.

Response Rate / Valid Instrument

The response rate is the number of valid instruments received divided by the number of registered students times 100. Where there are combined classes, the response rate may display in excess of 100% since the combined number of valid instruments may exceed the individual class enrolment. A valid instrument contains at least one valid response to ANY of the questionnaire items.

Mode Ratings

The 'mode' represents the rating value that is chosen most often. For all 11 rating items, the mode ranges from 1 (Strongly Disagree) to 7 (Strongly Agree). Where a question has a bi-modal or multi-modal result, all those values are displayed.

Standard Deviation (SD)

The standard deviation provides information regarding the consistency of a set of scores and is also useful for noting differences between two or more means. The higher the standard deviation, the greater the difference between the means must be to be meaningful. For USRI ratings, the 'grouped frequency distribution' algorithm was used to calculate the standard deviation. Blank and 'N/A' responses are not included in the calculation.

Demographic Categories

Data for categories that could be used to identify students will be withheld (the cell will contain 'WH') if any of the cells in that category contain only 1, 2, or 3 students. An asterisk (*) in any cell indicates that there were no responses for that category for that rating item.

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Multiple sections or courses taught together are surveyed together, and therefore, results are reported based on the aggregated responses and enrolment.

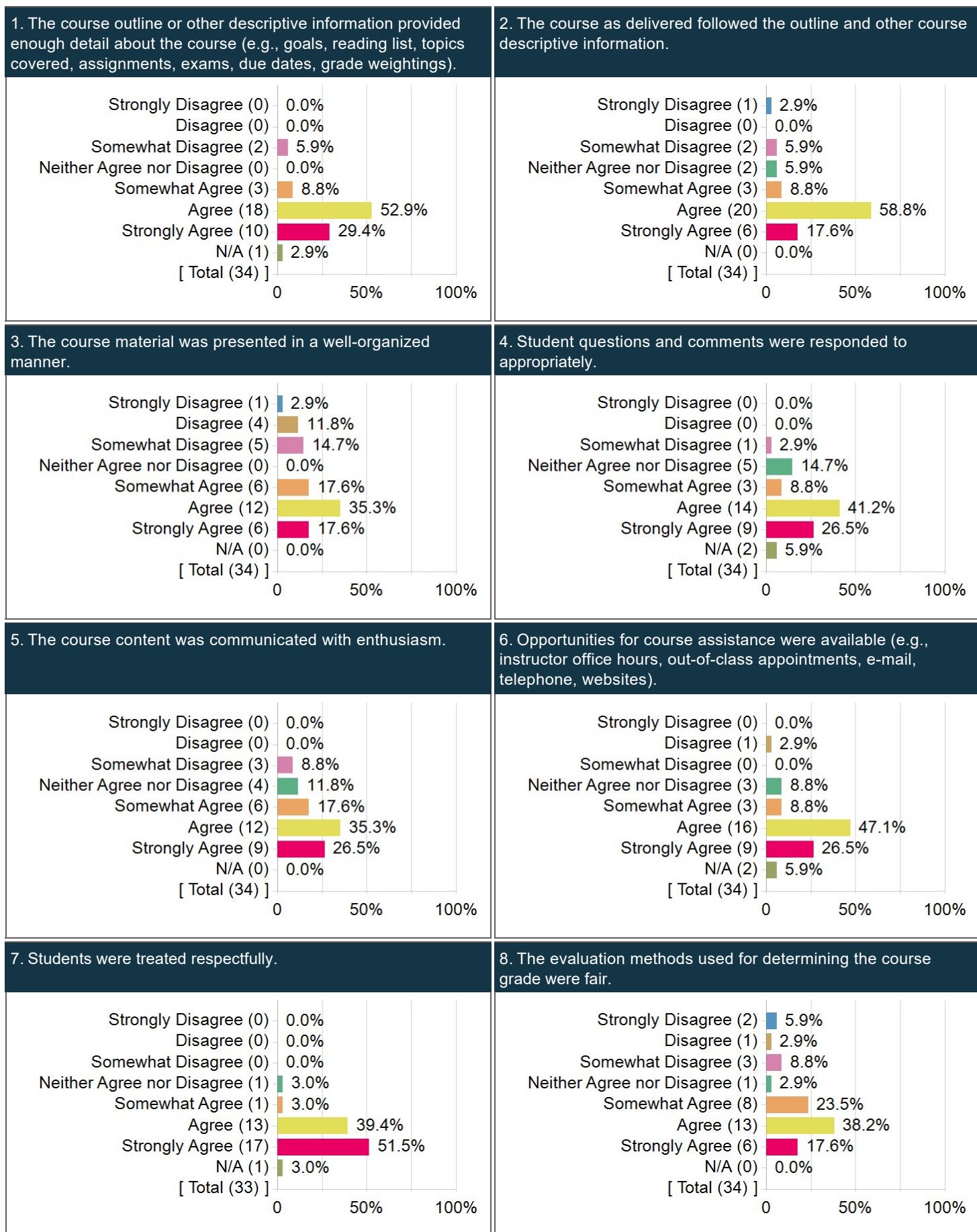
Exemptions

Courses with fewer than 8 registered students are generally not surveyed. Tutorial and Laboratory sections are only surveyed if they are the primary section for the course. Results will be published provided that they meet the following criteria: classes with 40 or more students must have at least 20% response rate; classes with fewer than 40 students must have at least 8 respondents. Instructors may opt-out from publishing due to extenuating circumstances.

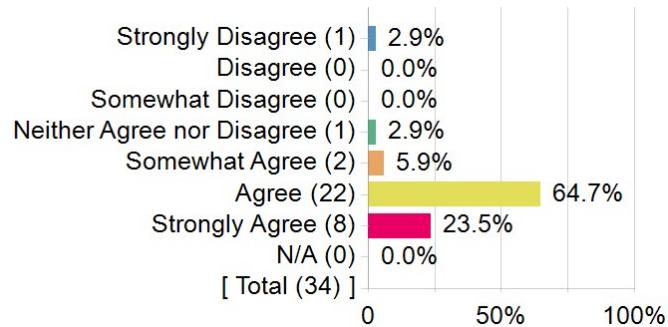
Copyright notice

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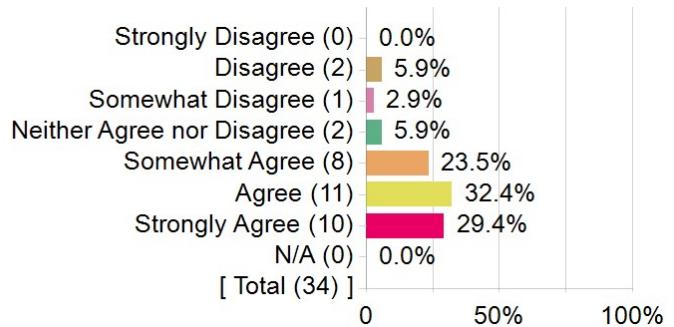
Frequency Distribution



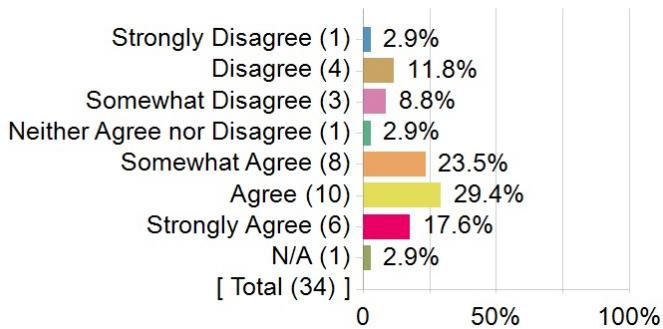
9. Students' work was graded in a reasonable amount of time.



10. I learned a lot in this course.

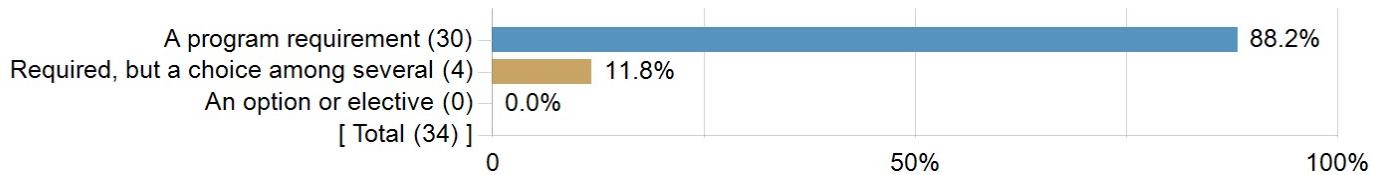


11. The support materials (e.g., readings, audio-visual materials, speakers, field trips, equipment, software, etc.) used in this course helped me to learn.

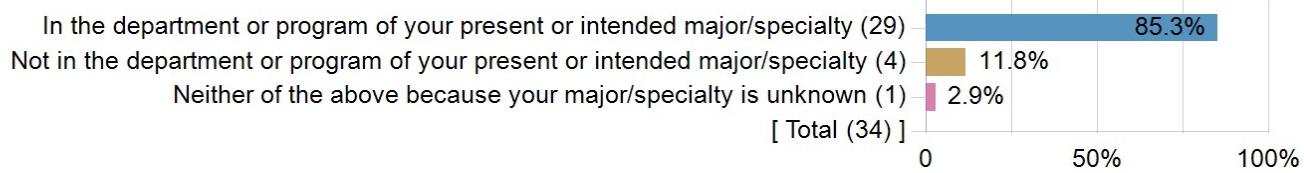


Additional Student Information

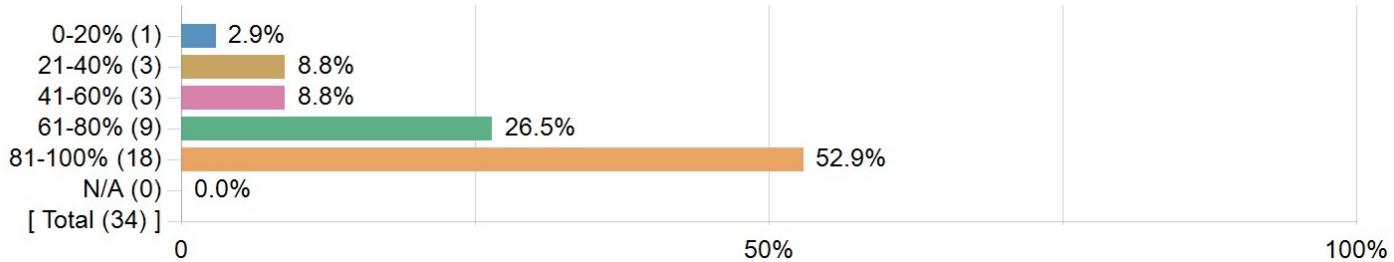
For you this course / course component is:



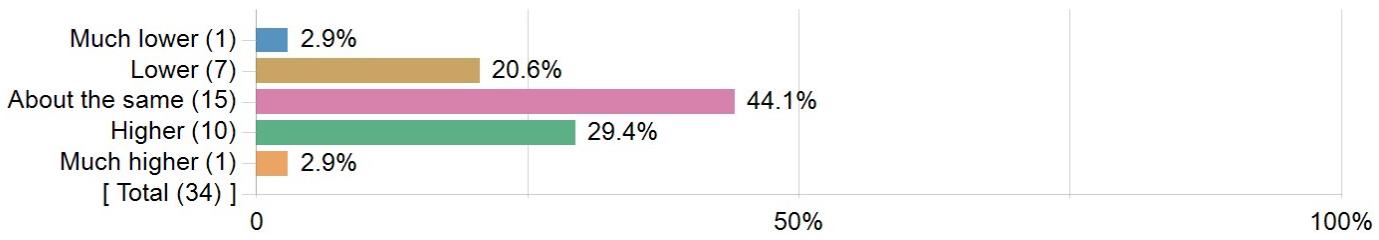
This course is:



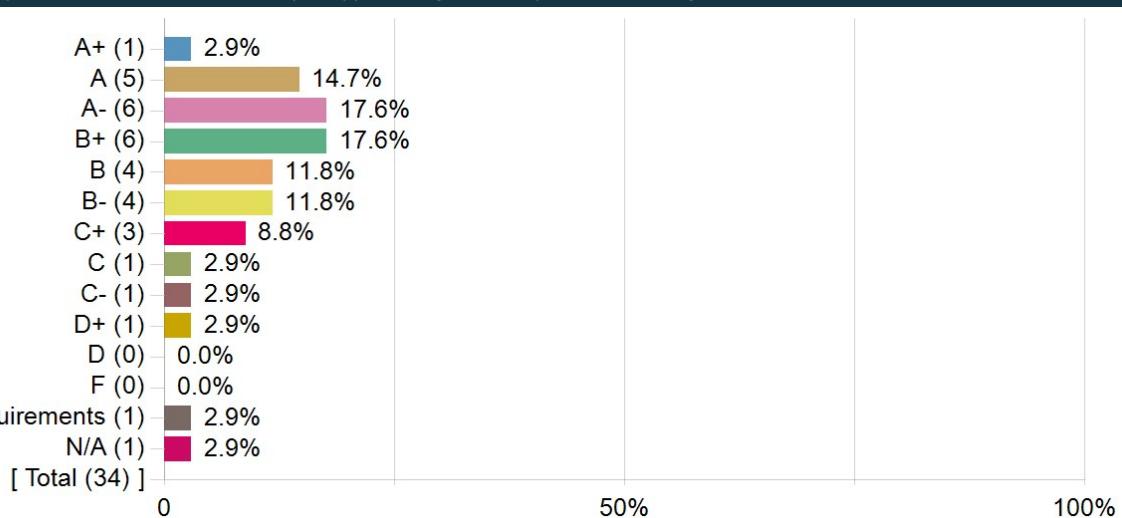
Percent of class sessions you have attended in this course / course component:



Compared to other university courses of this type (e.g., lecture, lab, practicum, distance education), the workload for the course / course component being evaluated is:



Based on the feedback that you have received to date (if any), what grade do you expect to get in this course / course component?



Overall

	Mode	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)	N/A
The course outline or other descriptive information provided enough detail about the course (e.g., goals, reading list, topics covered, assignments, exams, due dates, grade weightings).	6	0	0	2	0	3	18	10	1
The course as delivered followed the outline and other course descriptive information.	6	1	0	2	2	3	20	6	0
The course material was presented in a well-organized manner.	6	1	4	5	0	6	12	6	0
Student questions and comments were responded to appropriately.	6	0	0	1	5	3	14	9	2
The course content was communicated with enthusiasm.	6	0	0	3	4	6	12	9	0
Opportunities for course assistance were available (e.g., instructor office hours, out-of-class appointments, e-mail, telephone, websites).	6	0	1	0	3	3	16	9	2
Students were treated respectfully.	7	0	0	0	1	1	13	17	1
The evaluation methods used for determining the course grade were fair.	6	2	1	3	1	8	13	6	0
Students' work was graded in a reasonable amount of time.	6	1	0	0	1	2	22	8	0
I learned a lot in this course.	6	0	2	1	2	8	11	10	0
The support materials (e.g., readings, audio-visual materials, speakers, field trips, equipment, software, etc.) used in this course helped me to learn.	6	1	4	3	1	8	10	6	1

2023 Fall Faculty Form Report for MATH211-LEC-03 Linear Methods I - Greg Knapp

Project Title: **2023 Fall Course Survey**

Courses Audience: **95**
Responses Received: **34**
Response Ratio: **35.8%**

Report Comments

Dear Greg Knapp,

We are pleased to provide you with course feedback results for Course MATH211-LEC-03 Linear Methods I

If you have questions about accessing your report or technical difficulties, please contact
coursesurvey@ucalgary.ca.

If you have questions about your student feedback, please contact your academic leaders.

Sincerely,

UCalgary Course Survey Team

Creation Date: **Friday, March 22, 2024**

Course Feedback

Based on your experience this semester, what should a student do to succeed in this course?

Student Comments
Keep your attendance proper and try level best to keep up with the weekly work to not get overloaded at the end.
A student should use all available resources to practice the content in the course. Also, something I found very useful is the Lyryx engage website, which is useful to learn and understand the basic theorems with definition and examples, and at the end of the reading portion, the exercise which is useful in order to practice what you have just learned. Finally, on your own time, work on the weekly worksheets to practice the content.
Read the Lyryx textbook. The in-person lectures (and especially the labs) were hardly useful, as the labs were just time to go over the textbook on your own time, and the lectures were just solving questions that could be easily answered by just reading the text before hand.
Watch the online lectures as they are such a useful resource to understand this course.
Stay on top of all the provided workload and make sure that the student is not behind. Once the student falls behind it's very difficult to catch up.
Do your lyryx homework a week ahead of when it is due and you will not find this course to be stressful.
Try to stay ahead/on top of engage and lyryx homework.
Go to in class lectures, complete the worksheets, go over and take notes on the textbook, watch the online weekly videos, and complete the lyryx homework.
In order to do well, most students will have to attend PASS sessions in order to achieve more than just a pass in the course, and do extra compared to other courses.
Attend every lecture in order to learn and have a consistent routine with Lyryx engage (so that you don't get stuck doing it last minute) and the studio sessions can be attended if you have doubts to clarify, there are days where the studio sessions aren't as effective (usually when my concepts are clear for a certain module) but they can be useful if the student comes prepared with questions. (for midterm prep I used prep 101 videos and notes as a form of external resources)
regular practice, keeping up with assignments
Students should watch the videos prior to coming to class and ask any questions they had while watching the videos. Students should complete practice questions every step of the way and review what they had previously learned.
Keep up with day-to-day workload.
Hope that lyryx engage doesn't exist or at least contained more useful diagrams instead of bulk words.
Practice
Do Lyryx.
A student should use lyryx to practice about the content as it provides the most practice questions which is the best way to learn. Watching tutorial videos outside of d2l will also help students learn the content better.
Ifjsahdfsadf
A student should do a bit of practice problems to get experience with the types of questions and how to work with the equations and get familiar with it.
Watching the lecture videos and doing the assignments diligently should be enough.
Practice. Practice makes perfect. Of course, one should make sure to attend every lecture as well.
Take time to really understand the material on their own. The prof and TA's don't teach anything.
Ensure they stay on top of all coursework and address issues in comprehension immediately.
Do assigned homework and attend online lectures.
They should go over the online content on the lyryx application. It seems to have the best resources as well as having very good explanations for all of the content. Asking the TA's about any questions or to clear up any confusion will also really help. There are also multiple other websites on the internet that do a very good job of explaining what is going on,
A student should learn through Lyryx Engage and do practice problems on Lyryx.
Do the homework and study on their own and the hope for the best. Seek help whenever needed!!
attend lectures and online zoom, complete and do more practice in lyrix.
Keep up with the videos, which is something I haven't really done, but I've been fine. I think also reviewing the material at least once a week outside of allotted class time.

What did the instructor do that helped your learning in this course?

Student Comments
Our instructor made weekly worksheets for us and we used to solve them in class.
What really helped me was that my instructor was always available and willing to help, and answer everyone's questions. I also found helpful the way my instructor implemented the lectures.
While I didn't end up benefitting from the material that he had given, I did appreciate his enthusiasm and willingness to help the students.
The instructor went over the topics during lecture time and doing practice problems as well as helping students by answering their questions.
The instructor provided a lot of help ad answers to questions we had in the lectures. However, we never actually were taught in the lectures and instead had to learn everything online. I found this to be a very flawed method of teaching the course.
Presented what would actually be on the test clearly so students knew what to study for.
Greg's enthusiasm was very motivating.
Went over practice problems, answered student questions, and helped us work through worksheets.
Outlining what we were doing in the course relatively well.
Professor Knapp's lectures were easy to follow along and made concepts easy to understand while they were taught in real time.
solved questions in class, answers students questions
The instructor answered questions we had and worked through practice problems during class.
He always did an amazing job at answering questions.
The recorded zoom files that are hard to map out and hard to access
Nothing, self-taught course 100%.
Explains misunderstanding.
He helped answer my questions.
asdfasdf
The instructor helped by answering any questions in class and being available for if any students had any questions as well as bringing a very positive and upbeat attitude to the classroom which really helps students focus better rather than being boring and monotone
Not much
Overall being very explicative and open to feedback and questions.
Nothing, he provided only worksheets and taught nothing of actual value in class.
Asked students what questions they had and led lecture examples based on student questions.
The instructor was not instrumental to my learning in this course.
The instructor was ok. I found that he was very good for explaining anything that I couldn't've figure out on my own. I also appreciated the worksheets he made up for every lecture period.
He showed us how to do some difficult homework problems from the week prior which allowed me to understand how to do them.
Greg Knapp was really good explaining the materials it was just how the course was delivered in general. I see this course totally designed to be an online course only.
answer questions that i dont understand
He made precises notes, listens to student feedback, and constantly is engaging with the class, which makes it easier to stay on task and understand. He also constantly will stop periodically to check in with the class and ask if we have any questions.

What could the instructor modify that would have further helped your learning?

Student Comments
Although everything went really smooth in the course, I would say that the worksheets should be solved in class so that students participate more rather than just doing other homeworks while being in the class.
Personally, I find very useful when I am given printed materials such as worksheets to practice the content we learn. I feel that helps me to learn in a better way.
Instead of having the students just read the textbook, actually teaching the methods in person would have helped tremendously, and explaining the purpose for these methods would have cemented them in my mind had it been done more often.
Maybe doing a quick summary of every week's content would be beneficial as this course moves fast and it is easy to forget some

Student Comments
concepts from earlier in the course.
If the course were to have actual in person lectures I would feel more inclined to actually attend lectures and the workload would be much lighter on students as well.
Perhaps more of a breakdown of the questions in lyryx or release how to solve the problems step by step after they are due so students can know what to do for next time.
The online professor needs to be more on schedule with topics and clearer with his information.
Better use of time during long sessions, such as more practice problems instead of free time for almost the whole time.
Preparing lectures better, and going over things that people struggle with specifically.
A little recap of the topic we're on before the actual lecture could start would be of great help because I'm sure there are students that are confused during a lecture since they haven't been able to keep up with the modules during a lecture so when they attend one that covers something in the middle of it, it could be hard to keep up with the pacing of the lecture. Just some prerequisites that can be summarized before actually starting the new lecture.
everything was pretty good, one thing that concerned me was some student have online exams and some have in person, i think it should be fair for everyone and there should be either online or inperson for everyone
Give us practice problems (the ones we were given were almost completely unrelated to the course)
better communication between other instructors who also do the video lectures.
Created accessible and organized videos.
Teach during classes rather than have us work on teaching ourselves.
Have properly structured lessons, like other first year courses
I would like the lecture sessions to have more practice for students to do.
asdfasdf
Teach more theory in class rather than only doing questions, as well as maybe going table to table and see if anyone has any questions which they didn't want to ask for the whole class to hear due to possible anxiety etc
Use more time to explain the topic in class rather than the worksheets.
Not much, really. I would suggest he attends most Long sessions to allow for question–answering to be a bit less overbearing for the TAs, instead of only attending the first couple.
Actually show up to class and teach a lesson, not just provide worksheets for us to learn ourself.
perhaps recapping the week's content a bit more prior to taking student questions.
The instructor is enthusiastic about the course material but generally ineffective. There were inconsistencies between the in person short sections and the online lecture component. I tended toward the online lecture component to remain consistent. I stopped attending short sessions because it was a waste of time for me to make my way to school Monday morning at 8am for this class that was generally ineffective.
The textbook is terrible for this course. A massive amount of time is spent working on homework assignments and Lyryx engage assignment, yet it's only worth 25%... The time investment does not align with the weight for that component of the course.
Making the final exam worth 50% is just rude.
Another issue I have with the course is that the syllabus is confusing, it was a surprise to hear at the beginning of the term that there are online lectures every M/W/F that weren't in the schedule and they conflict with labs on Wednesday.
I think he could have been a bit more involved in the long sessions of the class. I found that I was never looking forward to going to the long session due to the fact that it was run solely by the TA's and devolved into just a free work period by the end of the term. I also think that it was a little odd that the instructor wasn't even there for the class he was teaching. Another point I would like to bring up is that I found the video lectures to be not very useful. I do however know people who thought they were helpful, but to me it was just a little unorganized and not very well put together. It was also quite evident that there was no communication between the instructor who was doing the online lectures, my instructor and the TA's, as multiple times they were trying to go over completely different topics at the same time. The online lectures were also horribly run, as most of the time I could not even access the videos to watch, as well as there being multiple links to not the video in each recording of the lectures. Luckily for me, I was doing well enough with just the lyryx modules. I almost think I would've done better with just the website and somebody I could go to to answer questions.
If he could even somewhat teach some of the content as Lyryx can be quite confusing at times.
Nothing to be honest. I think the whole delivery of course needs to be restructured. The homework was a very heavy workload. It would be nicer to get some more practical practice then dealing with very tedious homework.
I suggest that instructor could do more difficult problems during the lecture.

Student Comments

Nothing I think he's done a great job, and its just up to me.

Project Title: 2023 Fall Course Survey

Courses Audience: 58
Responses Received: 8
Response Ratio: 13.8%

Report Comments

The purpose of the University of Calgary Universal Student Ratings of Instruction (USRI) is to provide course instructors information they can use to enhance their teaching, provide students information that can help them in course selection, and information for academic administrators responsible for the assessment of teaching. It should also be recognized that the rating scores can be affected by factors that are not related to teaching and learning such as the identity of the course instructor, class size and the course topic and therefore should not be used independently to assess teaching quality. The information that the ratings provide and some of their limitations are discussed in more detail below.

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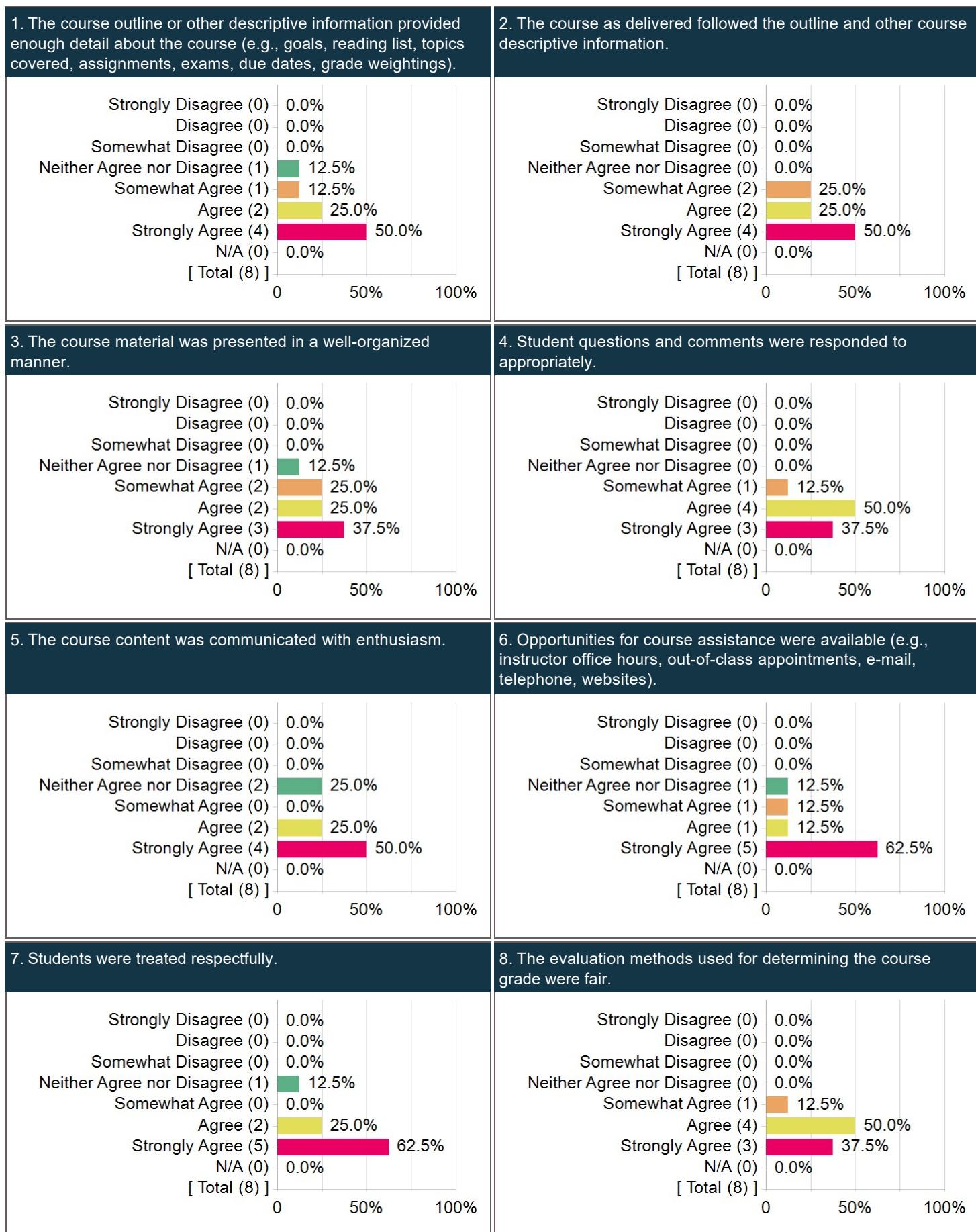
Exemptions

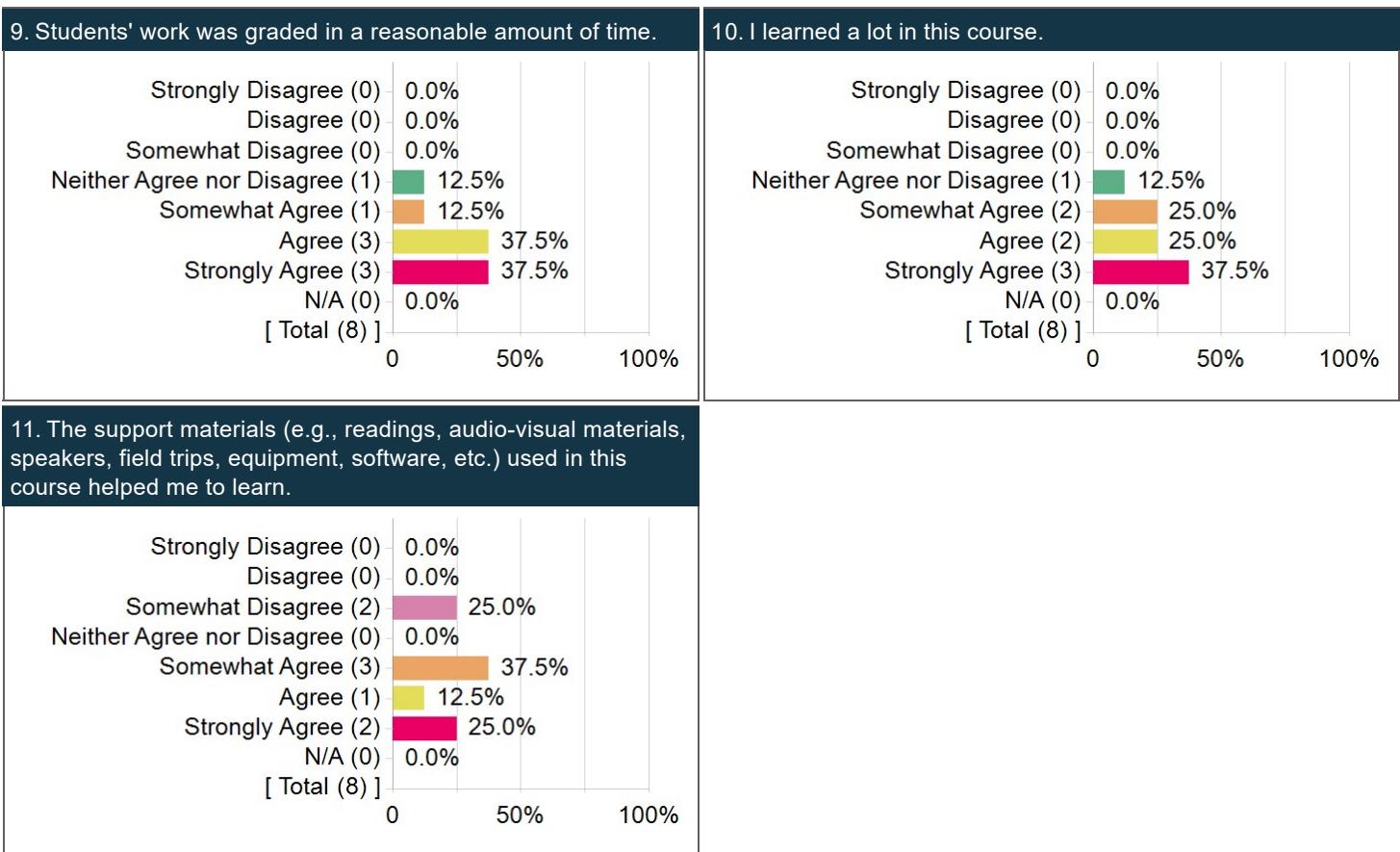
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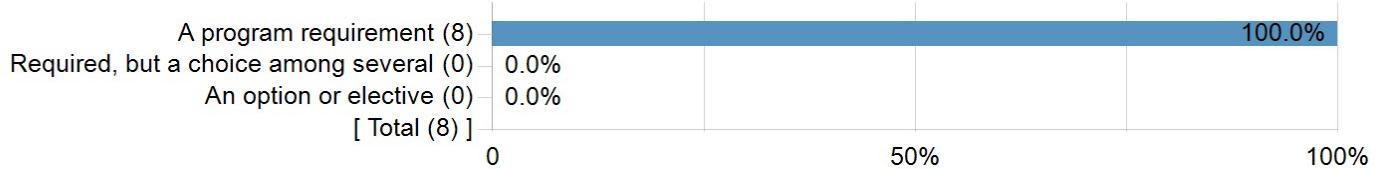
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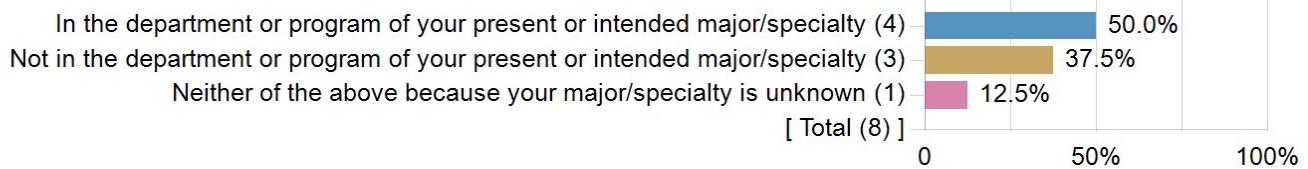


Additional Student Information

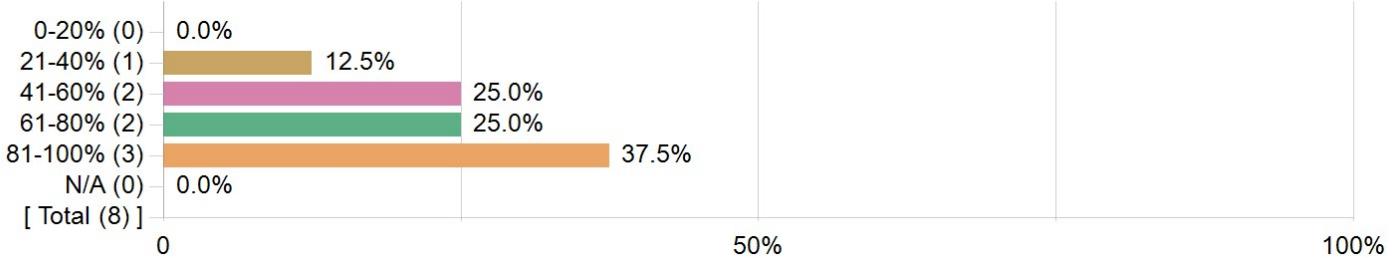
For you this course / course component is:



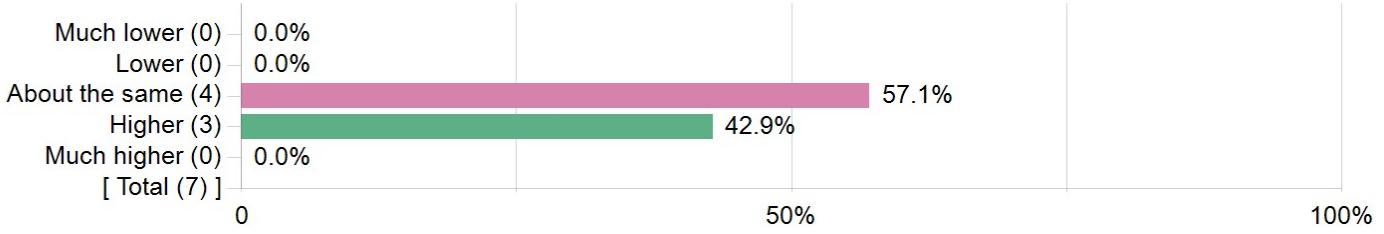
This course is:



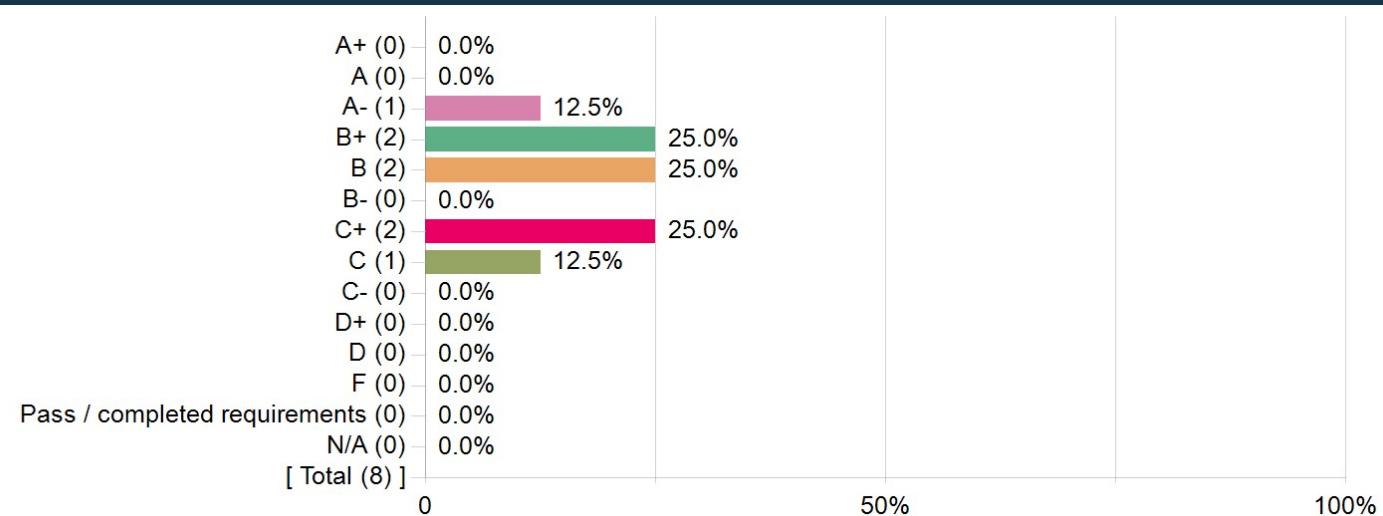
Percent of class sessions you have attended in this course / course component:



Compared to other university courses of this type (e.g., lecture, lab, practicum, distance education), the workload for the course / course component being evaluated is:



Based on the feedback that you have received to date (if any), what grade do you expect to get in this course / course component?



Overall

	Mode	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)	N/A
The course outline or other descriptive information provided enough detail about the course (e.g., goals, reading list, topics covered, assignments, exams, due dates, grade weightings).	7	0	0	0	1	1	2	4	0
The course as delivered followed the outline and other course descriptive information.	7	0	0	0	0	2	2	4	0
The course material was presented in a well-organized manner.	7	0	0	0	1	2	2	3	0
Student questions and comments were responded to appropriately.	6	0	0	0	0	1	4	3	0
The course content was communicated with enthusiasm.	7	0	0	0	2	0	2	4	0
Opportunities for course assistance were available (e.g., instructor office hours, out-of-class appointments, e-mail, telephone, websites).	7	0	0	0	1	1	1	5	0
Students were treated respectfully.	7	0	0	0	1	0	2	5	0
The evaluation methods used for determining the course grade were fair.	6	0	0	0	0	1	4	3	0
Students' work was graded in a reasonable amount of time.	6,7	0	0	0	1	1	3	3	0
I learned a lot in this course.	7	0	0	0	1	2	2	3	0
The support materials (e.g., readings, audio-visual materials, speakers, field trips, equipment, software, etc.) used in this course helped me to learn.	5	0	0	2	0	3	1	2	0

2023 Fall Faculty Form Report for MATH211-LEC-11 Linear Methods I - Greg Knapp

Project Title: **2023 Fall Course Survey**

Courses Audience: **58**
Responses Received: **8**
Response Ratio: **13.8%**

Report Comments

Dear Greg Knapp,

We are pleased to provide you with course feedback results for Course MATH211-LEC-11 Linear Methods I

If you have questions about accessing your report or technical difficulties, please contact
coursesurvey@ucalgary.ca.

If you have questions about your student feedback, please contact your academic leaders.

Sincerely,

UCalgary Course Survey Team

Creation Date: **Friday, March 22, 2024**

Course Feedback

Based on your experience this semester, what should a student do to succeed in this course?

Student Comments
Make sure you do all the assignments on time and achieve a 100% on all of it
Complete many practice problems.
just do the work, no short cuts.
Find online videos to cover the basis of vectors. Lyryx can be a pain to read through and sometimes omits critical information.
Get a really solid overview of the course and lightly learn all of the *concepts* before hyper fixating on solving a single 2 hour matrix problem. Don't be afraid of using calculators to check your work and get feedback and collaborate with other students as much as possible. It's very easy to waste time in this class thinking you're supposed to, in order to improve.
Also, use a highlighter on negative signs.
10/10, he's funny, an amazing lecturer, knows what he's doing, and super damn enthusiastic. I think his lecture sessions would work better as traditional lectures of the content followed by his practice questions. other than that going to his lectures was always valuable.
Go to all of Greg's lectures. watch the zoom lectures as well.

What did the instructor do that helped your learning in this course?

Student Comments
Not much, we haven't had a conversation at all other than the first day of University.
Went over some example questions and it allowed me to understand the problem solving process better.
he was friendly and i liked him and did a great job answering questions.
Nothing significant. By the end of the semester, no one was showing up in the lab because there was no point in going.
I would have liked to see our main instructor Greg more, his excitement was infectious and made a very authentic effort to not stop a problem until finished and we were satisfied with an answer.
Everything. Got a question? answered perfectly. Need extra help? he's got good office hours. He makes good worksheets that go a step beyond Lyryx work and that teaches you lots.
idk, he always managed to explain things in a way that made sense to me. He would also bring a relevance/motivation to the course material.

What could the instructor modify that would have further helped your learning?

Student Comments
Interact more with the students, don't just do questions.
A bit more practice problems but that might take too much time.
nothing the instructor can do but lyryx engage work is tantamount to torture. If you get a question wrong it doesn't help or provide hints or send you to the textbooks or tell you where and how you went wrong because of that you don't actually know and usually end up brute forcing your way though the questions which is counterproductive to learning linear algebra.
Physical handouts and something to do in the lab.
Greg mentioned that he was very new to the school and it felt that the school did not do a very good job onboarding him to the flow of U of C and could not answer certain questions to U of C. As well, he took over the video meeting classes so we didn't get to have him for class in person on Mondays. Losing him in person to the recordings definitely broke up the course quite a bit. One day a sub didn't show up and another spent an entire class working on a single problem, without solving it. The continuity and pacing of the class heavily suffered once he left to sub for those online recordings.
Just to be explicit, this is a critique of the MATH 211 program at large to self-organize and schedule better, not of the instructor, Instructor was rad.
I have a lot of thoughts on this course but 3 come on top: 1. the lecture videos were awesome. Long? yes, but super informative and makes our lives so much easier 2. Lyryx engage sucks. Having it be worth marks is just annoying honestly. Lyryx homework on the other hand is perfect, it teaches you and challenges you and works as perfect practice. 3. the lab sessions were very pointless, and no one really showed up. i think this class could actually benefit from having the lab session be traditional lectures instead?
Get rid of lyryx engage.. replace it with.. anything else

Project Title: 2024 Winter Course Survey

Courses Audience: 119
Responses Received: 24
Response Ratio: 20.2%

Report Comments

The purpose of the University of Calgary Universal Student Ratings of Instruction (USRI) is to provide course instructors information they can use to enhance their teaching, provide students information that can help them in course selection, and information for academic administrators responsible for the assessment of teaching. It should also be recognized that the rating scores can be affected by factors that are not related to teaching and learning such as the identity of the course instructor, class size and the course topic and therefore should not be used independently to assess teaching quality. The information that the ratings provide and some of their limitations are discussed in more detail below.

Students, course instructors, and administrators are strongly encouraged to review the [GFC USRI document](#) for an understanding of the policies and guidelines that apply to use of these ratings. Information on how to use student feedback responsibly can be found in the [Making Sense of Student Feedback](#) resource. Course instructors and academic leaders are encouraged to use this resource as a guide when reviewing student feedback.

Response Rate / Valid Instrument

The response rate is the number of valid instruments received divided by the number of registered students times 100. Where there are combined classes, the response rate may display in excess of 100% since the combined number of valid instruments may exceed the individual class enrolment. A valid instrument contains at least one valid response to ANY of the questionnaire items.

Mode Ratings

The 'mode' represents the rating value that is chosen most often. For all 11 rating items, the mode ranges from 1 (Strongly Disagree) to 7 (Strongly Agree). Where a question has a bi-modal or multi-modal result, all those values are displayed.

Standard Deviation (SD)

The standard deviation provides information regarding the consistency of a set of scores and is also useful for noting differences between two or more means. The higher the standard deviation, the greater the difference between the means must be to be meaningful. For USRI ratings, the 'grouped frequency distribution' algorithm was used to calculate the standard deviation. Blank and 'N/A' responses are not included in the calculation.

Demographic Categories

Data for categories that could be used to identify students will be withheld (the cell will contain 'WH') if any of the cells in that category contain only 1, 2, or 3 students. An asterisk (*) in any cell indicates that there were no responses for that category for that rating item.

Cross-Linked Courses

Cross-linked courses, i.e. those that are taught by the same instructor at the same time, are treated separately for the purposes of USRI. Ratings are based on the responses given by students registered in each course. Exemptions apply to each course separately, so it is possible for one course to be published and not the other.

Combined Classes

Multiple sections or courses taught together are surveyed together, and therefore, results are reported based on the aggregated responses and enrolment.

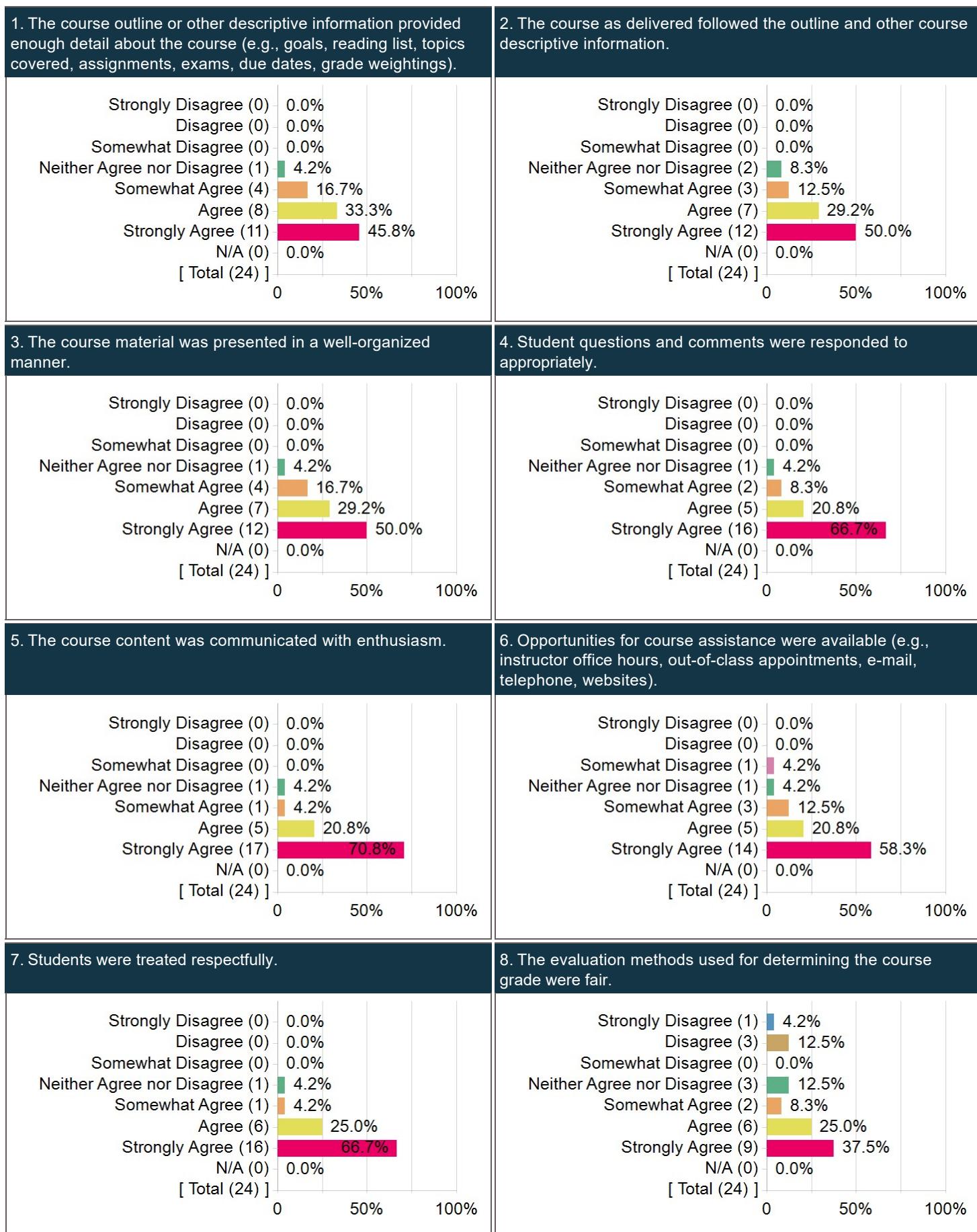
Exemptions

Courses with fewer than 8 registered students are generally not surveyed. Tutorial and Laboratory sections are only surveyed if they are the primary section for the course. Results will be published provided that they meet the following criteria: classes with 40 or more students must have at least 20% response rate; classes with fewer than 40 students must have at least 8 respondents. Instructors may opt-out from publishing due to extenuating circumstances.

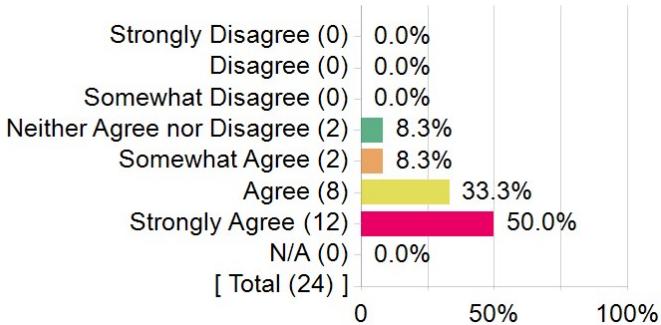
Copyright notice

These ratings are copyrighted by the University and are not to be used for anything other than their intended purpose, as outlined in the [GFC USRI document](#).

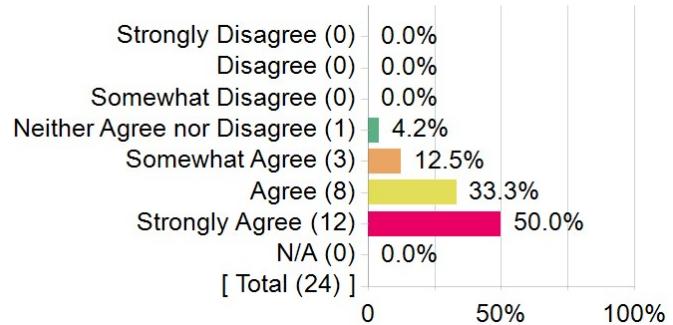
Frequency Distribution



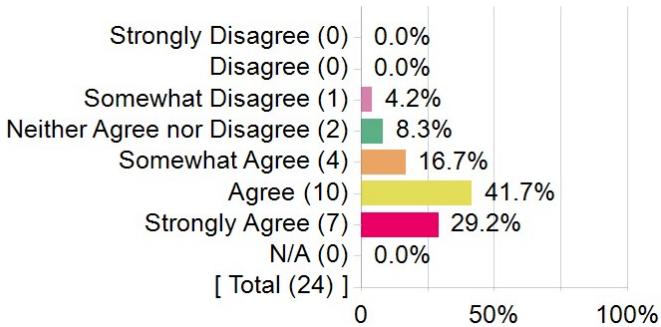
9. Students' work was graded in a reasonable amount of time.



10. I learned a lot in this course.

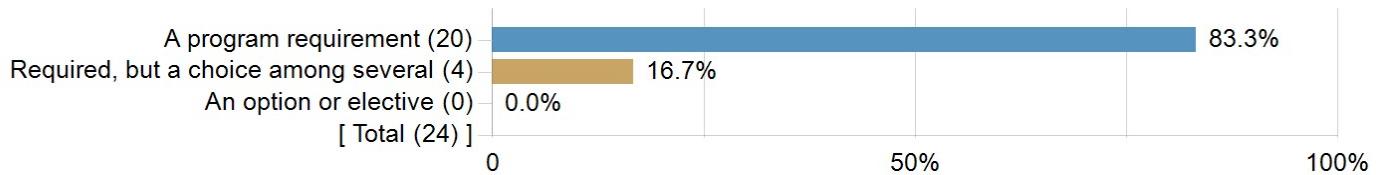


11. The support materials (e.g., readings, audio-visual materials, speakers, field trips, equipment, software, etc.) used in this course helped me to learn.

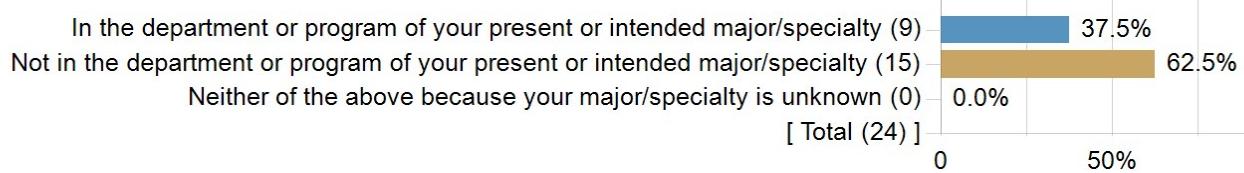


Additional Student Information

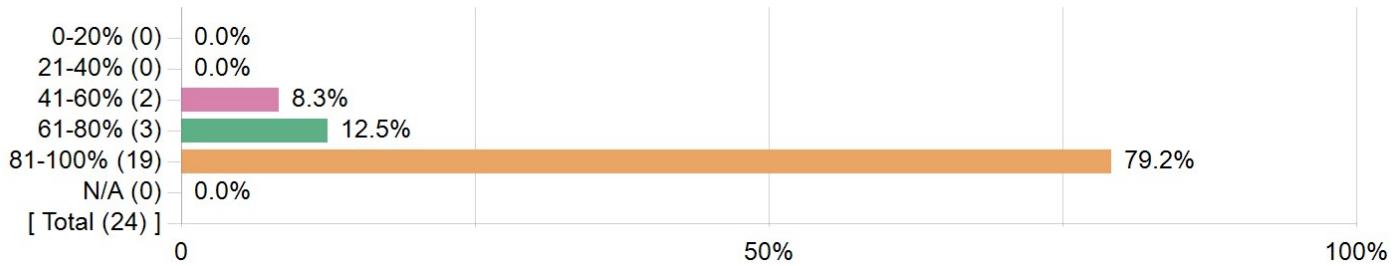
For you this course / course component is:



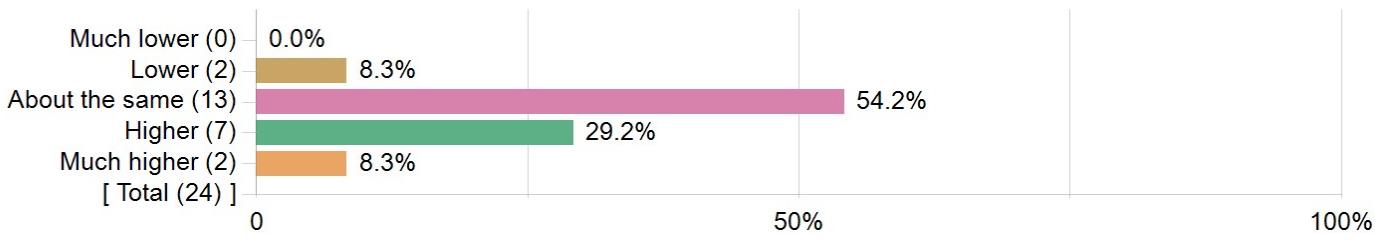
This course is:



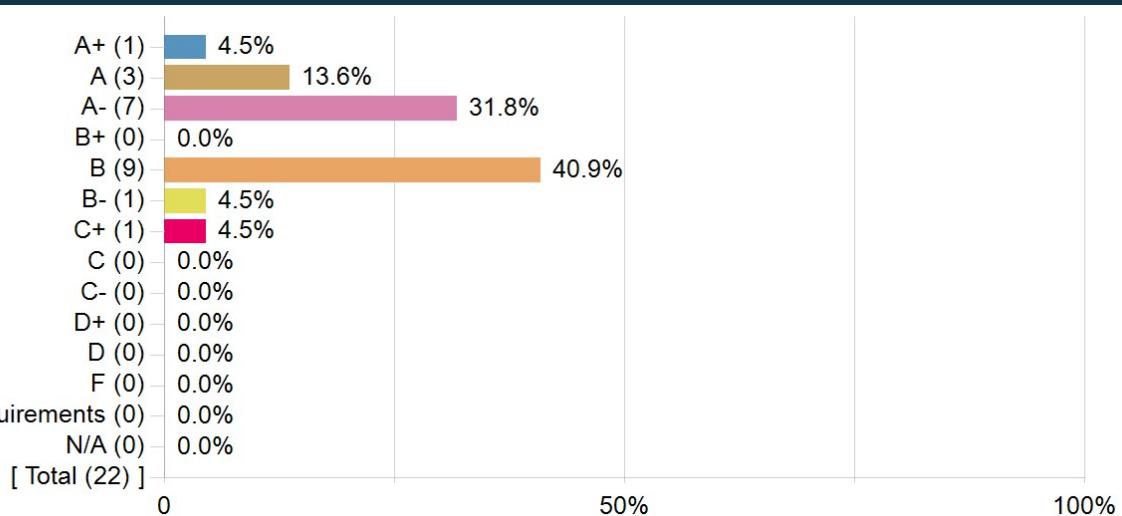
Percent of class sessions you have attended in this course / course component:



Compared to other university courses of this type (e.g., lecture, lab, practicum, distance education), the workload for the course / course component being evaluated is:



Based on the feedback that you have received to date (if any), what grade do you expect to get in this course / course component?



Overall

	Mode	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)	N/A
The course outline or other descriptive information provided enough detail about the course (e.g., goals, reading list, topics covered, assignments, exams, due dates, grade weightings).	7	0	0	0	1	4	8	11	0
The course as delivered followed the outline and other course descriptive information.	7	0	0	0	2	3	7	12	0
The course material was presented in a well-organized manner.	7	0	0	0	1	4	7	12	0
Student questions and comments were responded to appropriately.	7	0	0	0	1	2	5	16	0
The course content was communicated with enthusiasm.	7	0	0	0	1	1	5	17	0
Opportunities for course assistance were available (e.g., instructor office hours, out-of-class appointments, e-mail, telephone, websites).	7	0	0	1	1	3	5	14	0
Students were treated respectfully.	7	0	0	0	1	1	6	16	0
The evaluation methods used for determining the course grade were fair.	7	1	3	0	3	2	6	9	0
Students' work was graded in a reasonable amount of time.	7	0	0	0	2	2	8	12	0
I learned a lot in this course.	7	0	0	0	1	3	8	12	0
The support materials (e.g., readings, audio-visual materials, speakers, field trips, equipment, software, etc.) used in this course helped me to learn.	6	0	0	1	2	4	10	7	0

2024 Winter Faculty Form Report for MATH211-LEC-04 Linear Methods I - Greg Knapp

Project Title: **2024 Winter Course Survey**

Courses Audience: **119**
Responses Received: **24**
Response Ratio: **20.2%**

Report Comments

Dear Greg Knapp,

We are pleased to provide you with course feedback results for Course MATH211-LEC-04 Linear Methods I

If you have questions about accessing your report or technical difficulties, please contact
coursesurvey@ucalgary.ca.

If you have questions about your student feedback, please contact your academic leaders.

Sincerely,

UCalgary Course Survey Team

Creation Date: **Monday, May 13, 2024**

Course Feedback

Based on your experience this semester, what should a student do to succeed in this course?

Student Comments
Need to do your weekly Lyryx assignments on time, have a good grasp of what's going in class and practicing a lot of questions.
Attend lectures and office hours. As well as do the provided practice midterms.
This course is hard, so when you're unsure ask for help and practice the problems.
The midterms are hard and difficult due to the time constraint so prepare yourself well enough and have a good handle on the course content.
Do all homework, and then do it again for practice. Attend class and ask many questions even if they seem stupid.
Take a look at the homework before attending the lecture. Read the handouts beforehand.
Study a lot for the tests as they make up 80% of the final grade
Practice Regularly
Keeping up with the classes. Try to make sense of the material.
Spend time outside of lectures doing practise questions to get efficient at completing exam questions.
i do not know
Take notes in class
Keep up with all the topics, you can fall behind easily.
Topics build off of each other, so make sure you are understanding content as you go.
Do a lot of practice and use the lyryx engage section for learning too! super helpful
Do the practice
The course is very very difficult, pay attention in classes and put in quite a bit of practice outside of class.
<ul style="list-style-type: none"> – Attend all lectures, take notes of concepts and demos, ask questions in and after class – Review lecture recordings to work through demos that they didn't follow, fill in things they weren't able to note down, and go over hard concepts more slowly at their own pace – DON'T try and do the lyryx at the last minute. Don't miss lyryx cause you left it to the evening it's due and think "oh, it's not worth that much, I'll review the stuff later and make it up for the exam." You will fall behind. (... I lost marks and fell behind this way) – Familiarize yourself with lyryx engage, pass sessions, math help centre, and other resources at the START, even if you don't think you'll need/use them. If you ever want them later it'll be more intimidating if you're halfway through the class and already set in your ways and stressed about being behind, and now have to deal with approaching something unfamiliar. Check them out in the first few weeks!!
Specifically utilize the practice midterms and the Lyryx questions to study for the midterm. Also, studying the concepts specifically and memorizing theorems/formulae is key.
Attending lectures is the biggest thing (as usual), and always make sure to give yourself a lot of time on the homework assignments, some go super fast and some take way longer than you'd expect.
Attend class, take notes, and enjoy Greg's presentation. Excellent experience, thank you Greg!
Be proactive and work ahead as much as possible. Work on the additional questions that are not for marks and ask many questions in lecture for clarity
Keep up on the work, or else you will fall behind and once midterms roll around, it will be overwhelming. Keeping up on the assignments is not enough, you need to engage in the textbook and attend the PASS sessions to fully understand the content.

What did the instructor do that helped your learning in this course?

Student Comments
Gave good explanations for each topic with examples . Answered all doubts clearly leaving no more doubts.
Provided assistance via office hours and email, as well as in class questions.
Greg was great! He taught with so much energy and took the advice given to him after both midterms and applied that to his teaching and the way he was delivering the content
He went at an excellent pace, was very kind and always made it seem okay to ask questions no matter the understanding level, and had exceptionally well organized notes.
Everything he can to make the learning journey easier.
Was helpful and good at teaching
Made his work in class available online
Posting the lecture notes to D2L.
Went through in class examples slowly and carefully and also provided definitions for new terminology.
i do not know
Do in lecture examples
Teach with enthusiasm, though it is really challenging, and did zoom recordings which I really appreciate.
He was very supportive and welcoming of questions, and made a great effort to explain things through various means when students were confused.
Provided practice questions and helped give a visual representation of some abstract concepts
Examples
Dr Knapp was really good about explaining things in multiple ways, midway through the semester he had a survey of what he could do better on in the course and i thought that was really good.
<ul style="list-style-type: none"> – Useful recaps of previous class at start of each class – Efficient, clear, WONDERFULLY delivered lectures that thoroughly explained content – Responded to student questions very very well!! Fostered very good atmosphere to ask questions in and after class, very good at pausing to ask “any questions?” before moving on to the next idea, without losing the efficiency of the lecture too much – Recorded the lectures in class and posted them, allowing us to review them. This was VERY useful given the pace required to cover all content in lecture, since if I missed a small detail I could keep up with the rest of the lecture knowing I could check what he'd said in the video later – Very supportive and communicative with the class. Asked us for feedback in a survey midway through, communicated with us how he was implementing it, directed us to math help centre and supports. – Wonderful bright, sunny attitude – The way he lead us through the material and connected ideas together was SPLENDID. The fact that he was so fluid and clear just talking through the demos was really impressive. – Beautiful ability to bring clarity and humour to the absolute absurdity that is an hour and a half straight of linear algebra. This class could have been boring, dense, and confusing with another professor but with him it was just great. – Honestly such a splendid professor, he deserves the world, he's so great. Absolute joy to take this class.
Added in additional, somewhat tangential thought during lecture that addressed any kind of question a beginner learn in class would like ask.
Recorded lectures for future reference (super super helpful), and was always enthusiastic and ready to start the lecture right on time. Greg was great at answering student questions, and wouldn't move on until the question was answered in a way we understood to ensure we were keeping up with the material. It felt like no one was ever left behind to figure something out on their own, which was really nice.
Greg actively modified his lectures to accommodate additional methods of learning after student suggestion and to great success. Anytime a student asked a question he was very professional and encouraging with his response and even took a step further and expanded adding extra understanding for something the students didn't even know they had questions about.
They did a great job with examples, and communicating the concepts clearly
Professor Knapp is genuinely amazing. He made an effort to keep his lectures as engaging, efficient, and exciting as possible.

What could the instructor modify that would have further helped your learning?

Student Comments
Maybe practice more questions of the difficulty that comes more frequently in the exam.
Nothing. The instructor did a fantastic job.
The only thing would be doing more questions similar to that in the exam. I felt and herd that most students went into the first midterm feeling good and then being surprised on the types of questions.
I would have appreciated some motivation for the problems. I often felt like I was doing things for no reason which was not helpful to my overall contentment with this course.
Nothing. Everything was perfect.
Nothing
More resources outside of class.
More conceptual or theory based in class examples, similar to what is on exams. Also having a better evaluation method for this kind of course where there are long or short answer questions on exams giving students more opportunity to show their knowledge.
i do not know
Include more theory based practice questions in lectures to help students understand the concepts on a deeper level. He did do that a bit recently but would've helped if it was being done since the start.
Lessen the definition, and concentrate more on solving
Give harder class examples to solve in class
N/A
No comments.
– Provided more optional practice problems via d2l right from the start. He improved this through the semester, posted some practice stuff on d2l about halfway through, but often directed us to lyryx engage questions which unless I was missing something, I could only access as a phone app where I had to flip through the digital textbook to find a few scattered Qs, which felt like more trouble than it was worth, especially on my phone. Some more normal-worksheet-type resources would have been valuable. – He fell a *tiny* bit behind on material so there were some days we had to rush a bit, that could be better balanced? But in my mind it's better to have to accelerate once we've got into the flow of the class than to hit the ground running too fast and lose people in the first few weeks. So not a big issue.
(These are such minor things though he was GREAT!! I loved this class!!)
Including fully completed worked examples connecting the concepts together.
No recommendations.
I found Greg's effort to be the maximum of what can be delivered by an individual with the amount of material to cover in the allotted time. I think the classes needed a slower pace or more time for the current pace to really facilitate the students learning.
They did a terrific job! Highly recommend for any other students taking this course. I would suggest they just set class rules at the beginning g of the semester to have no talking when they are lecturing
More practice questions and lectures that are catered towards the midterm.

Project Title: **2024 Fall Course Survey**

Courses Audience: **179**
Responses Received: **78**
Response Ratio: **43.6%**

Report Comments

The UCalgary Course Experience Survey (UCES) provides students with an opportunity to give feedback to course instructors on their learning experience. This information is intended to enhance teaching, provide students with information to assist with course selection, and to provide information to academic leaders responsible for the assessment of teaching.

Student course feedback can be affected by factors that are not related to teaching and learning, such as the identity of the course instructor, class size and the course topic.

UCES is administered each academic term for academic courses subject to provisions as outlined in the 1998 USRI Report. UCES consists of a set of six core institutional questions and five student information questions. These may be accompanied by an additional set of questions developed by and specific to the faculty associated with the course which are reported on separately.

Further information about UCES can be found [here](#), including support for [making sense of your student feedback](#).

Any sharing or reporting of information collected in the UCES will be done in accordance with UCalgary's Privacy Policy.

Project Title

This is the year and term for which the report refers to.

Courses Audience

Final number of students enrolled in a course.

Responses Received

Number of students that submitted a course survey.

Response Ratio

Percentage of students that submitted a course survey.

Creation Date

Date for which the report was generated.

Number Times Taught

Number of times the instructor has taught the course within the last 10 years.

Additional Student Information

Questions asked of students to give additional student information about their course.

Frequency Distribution

Bar graph that displays the frequency of responses for each the rating items (Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree, and Unable to Comment) within a singular question, which includes the number (#) of responses and corresponding percentage (%).

Overall Section

The 'mode' represents the value that is chosen most often within a question. For all 5 rating items, the mode ranges from 5 (Strongly Agree), to 1 (Strongly Disagree). Where a question has a bi-modal or multimodal result, all values are displayed.

Student Comments

List of student comments that answered the question, "Please provide additional information for any of your answers above", in reference to the five core institutional questions.

Cross-Linked Courses

Cross-linked courses, i.e. those that are taught by the same instructor at the same time, are treated separately for the purposes of course feedback surveys. Ratings are based on the responses given by students registered in each course. Exemptions apply to each course separately, so it is possible for one course to be published and not the other.

Combined Classes

Multiple sections or courses taught together are surveyed together within the same course survey, however, divided per course instructor, with separate reports. Individual instructor results are not shared amongst instructors within a course.

Exemptions

Courses with fewer than 8 registered students are generally not surveyed. Tutorial and Laboratory sections are only surveyed if they are the primary section for the course. Results will be published provided a minimum of 8 responses and 20% of the course enrolment response rate is met.

Instructors may opt-out from publishing due to extenuating circumstances with the approval of the Dean or their delegate.

Copyright notice

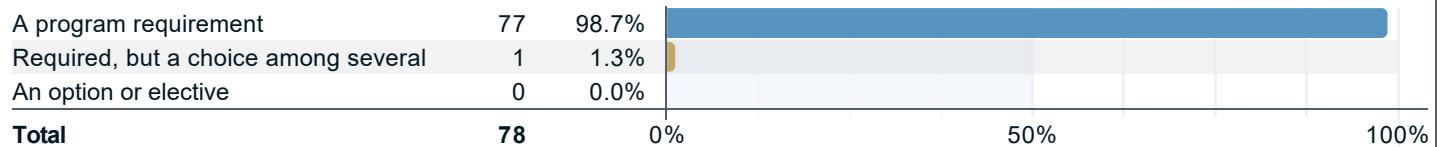
In accordance with its IP Policy, the University owns the intellectual property of the UCES, including all data and reports compiled therefrom. Personal information collected in the UCES is collected under section 33(c) of FOIP and is in the custody and control of the University.

Number Times Taught

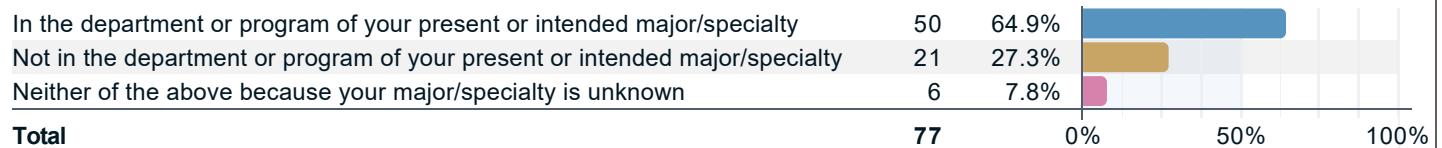
Number of times the instructor has taught this course / these combined courses (last 10 years including the current term): **5**

Additional Student Information

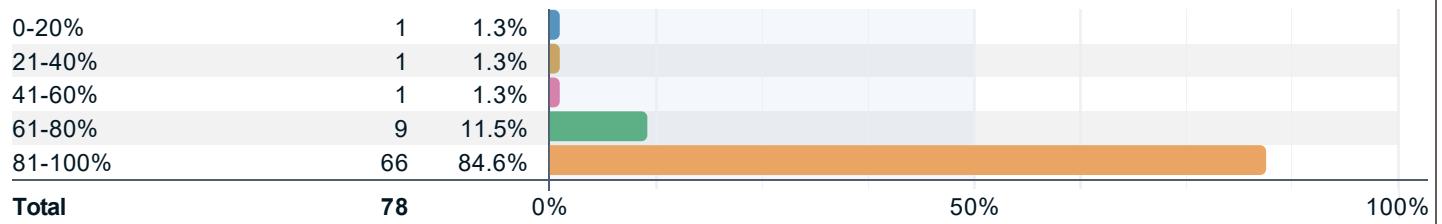
For you this course / course component is:



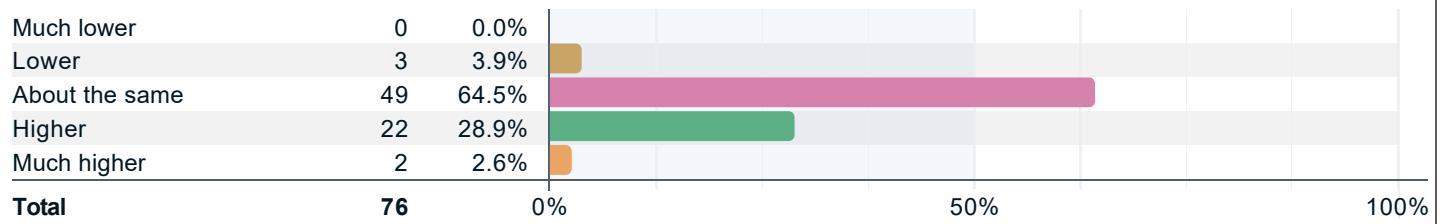
This course is:



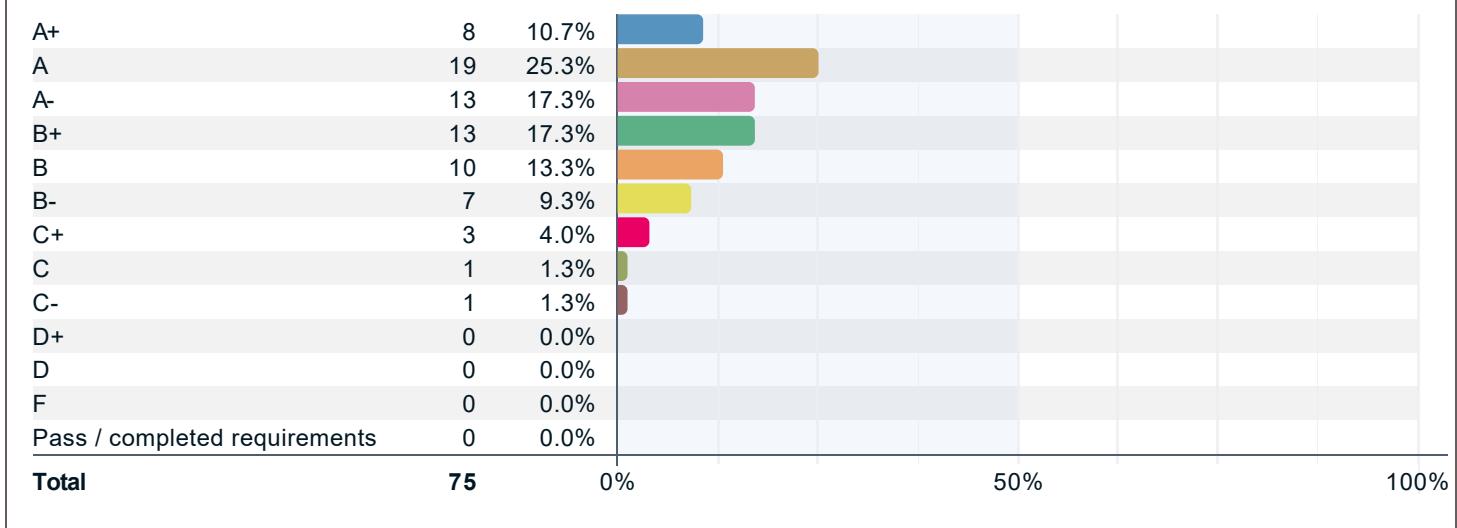
Percent of class sessions you have attended in this course / course component:



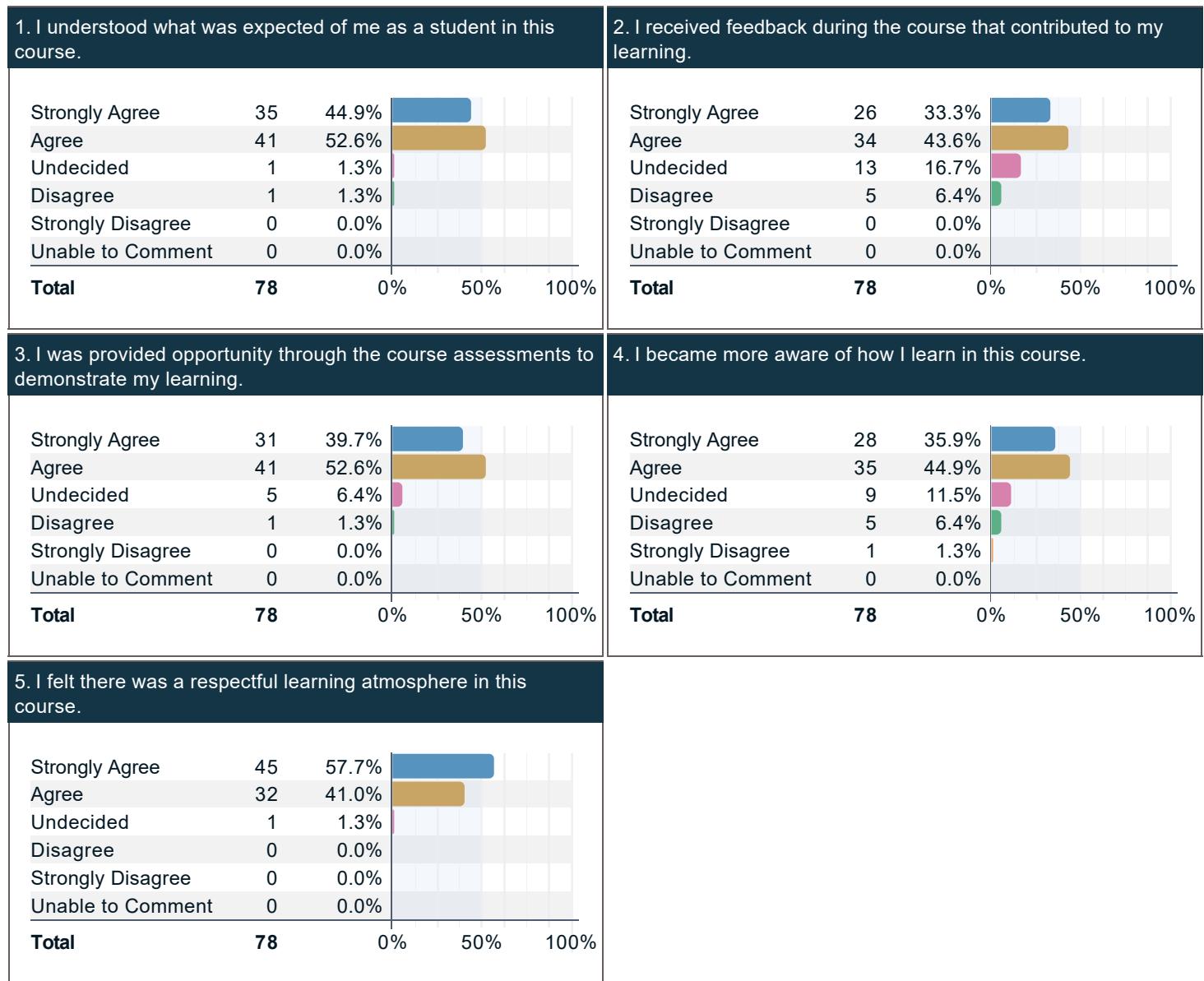
Compared to other university courses of this type (e.g., lecture, lab, practicum, distance education), the workload for the course / course component being evaluated is:



Based on the feedback that you have received to date (if any), what grade do you expect to get in this course / course component?



Frequency Distribution



Overall

	Mode	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree (1)	Unable to Comment
I understood what was expected of me as a student in this course.	4	35	41	1	1	0	0
I received feedback during the course that contributed to my learning.	4	26	34	13	5	0	0
I was provided opportunity through the course assessments to demonstrate my learning.	4	31	41	5	1	0	0
I became more aware of how I learn in this course.	4	28	35	9	5	1	0
I felt there was a respectful learning atmosphere in this course.	5	45	32	1	0	0	0

Student Comments

Responses to "Please provide additional information for any of your answers above."

Our Instructor for this course is wonderful. I enjoyed going to his lectures and he is one of the best teacher so far. I don't see any improvement that he could do to make this course better. However, I feel like it is not fair to any student to write exams on scantron sheets. With thousands of students it is easier to mark but students will never get any part marks for their answers. The format is the exam doesn't justice the hard work. If someone knows the concept and clearly demonstrate it right that person should deserve the part marks which could be done if it is made subjective(on the paper). A small calculation error in the final calculation or any intermediate step should not count towards 0 to that question. It is absolutely unfair and management should work on it to make it more justified

Greg Knapp was a good instructor who taught in a clear and easy to understand way and answered student's questions to acutely clarify confusing topics.

This class was great, and so was Mr. Knapp!

Tuesday Lectures were quite noisy when students were chatting and joking around at loud levels in the back of the room. Professor Knapp requested on several occasions for students to tone it down but this wasn't always successful as many students didn't care.

My professor Dr. Knapp was phenomenal! He was by far my favorite instructor as he was engaging in lectures, and very enthusiastic, and eager to answer any questions that came up! I was able to receive a proper explanation of parameters when I was confused by him, and that really aided my understanding for the entire rest of the course. As well, the TA's during my studio sessions were also friendly and able to assist in their roles.

Greg Knapp was a very insightful instructor and was able to thoroughly teach through materials while still taking time to allow students to explore and question areas that we might have struggled with. He was kind and understanding, and did not undermine simple or basic questions that were asked. In general, He was a very compassionate and caring professor who took time to find the best ways to help us fully understand this course.

Gregg is an amazing instructor

TA's could be trained better, to me only the professor gave constructive help or feedback in lab sessions.

No additional input

Dr. Knapp has been an extremely interactive professor who makes sure his teaching style reflects on what's most comfortable to his students.

Greg is super awesome and he's probably my favorite instructor as of now. He is very patient and tries his best to make sure everybody learns, and he makes sure to welcome everyone with a respectful atmosphere.

One of the better structured courses. Very well designed.

The instructor Gregg Knapp was really helpful and really helped me understand the course and kept me engaged throughout the lectures and I cannot recommend him enough to anyone taking this course in the future.

The instructor offered detailed explanations of the different topics and gave valuable answers to questions, taking care that all questions were properly answered. Also had a good attitude toward the students, and made the course mo enjoyable despite its difficulty.

Dr Knapp was an exceptional professor, whose pleasant demeanour and thoughtful teaching method was pivotal to my personal success in this course. Dr Knapp ensured to address questions in an effective and clear manner, and checked for understanding after each topic was discussed. Furthermore, the topics discussed throughout this course were communicated in a clear and concise manner, and the examinations were fair and reflected the level of difficulty communicated and practiced in class. Overall, I had a very positive experience in this class, and was glad with the lectures, studio sessions, and examinations.

Was a pleasure to be taught by Mr. Knapp, a very helpful teacher who explained all of the topics extremely well and also took the time out of his day to answer a lot of my emails in detail and help me out in class!

Professor Knapp the best professor I've had throughout university, and one of the best teachers I've had throughout my learning journey. His passion for the subject makes it really easy for students such as myself to understand the material, and want to learn more.

The course was well structured; it provided enough content for student success, and was generally one of the best courses required for the first year of engineering. The apps used in the course were useful, additionally, the assignments were not only fair but essential in understanding the material with more depth. Overall, a very enjoyable course.

Greg Knapp was very respectful and friendly. Also very good at explaining topics that were covered rather poorly in the video lectures.

This course has a lot of assingment lyrx engage, homework assignments, post video quesses , and then the lab that are worth less than the should be. The shorts that i seen on instagram regarding students suffering is true because of the two math courses. Figure out how to make it more livable.

Pleaseeeeeeee

The videos need improvement as the concepts and example questions are not properly explained.

Professor Knapp is really a kind and good teacher! At first I was nervous about linear algebra because I think it is hard, but he just make the Maths much more easier and interesting!

Dr. Knapp shows that he truly cares about the students he teaches. Every lecture he goes over important examples and explains

Responses to "Please provide additional information for any of your answers above."

them thoroughly, even though he only gets two hours a week to cover the lecture video content. His teaching methods are extremely good. Furthermore, during the studio sessions, he is always there present to help students out with whatever questions they have. Halfway through the semester, one of the TAs forgot to check the next page of our worksheet so they marked it as a 50%. I emailed Dr. Knapp during the evening to fix this issue, he emailed me back within 20 minutes. He said he was very busy at the time and would get back to me as soon as possible. The next morning he emailed me telling me he fixed it, and to let him know if the changes have been fixed on my end. Not only did he fix the issue within 12 hours, but he wrote me an email almost immediately, letting me know he has received the email, and will get to working on it as soon as possible. Little things like this show how much he cares about his students. I hope as he continues his career, he will continue to care just as much as he did this year.

Project Title: **2024 Fall Course Survey**

Courses Audience: **179**
Responses Received: **78**
Response Ratio: **43.6%**

Report Comments

Dear Greg Knapp,

We are pleased to provide you with course feedback results for Course 2247-75926(MATH211-LEC-01 Linear Methods I,MATH211-LEC-02 Linear Methods I)

If you have questions about accessing your report or technical difficulties, please contact
coursesurvey@ucalgary.ca.

If you have questions about your student feedback, please contact your academic leaders.

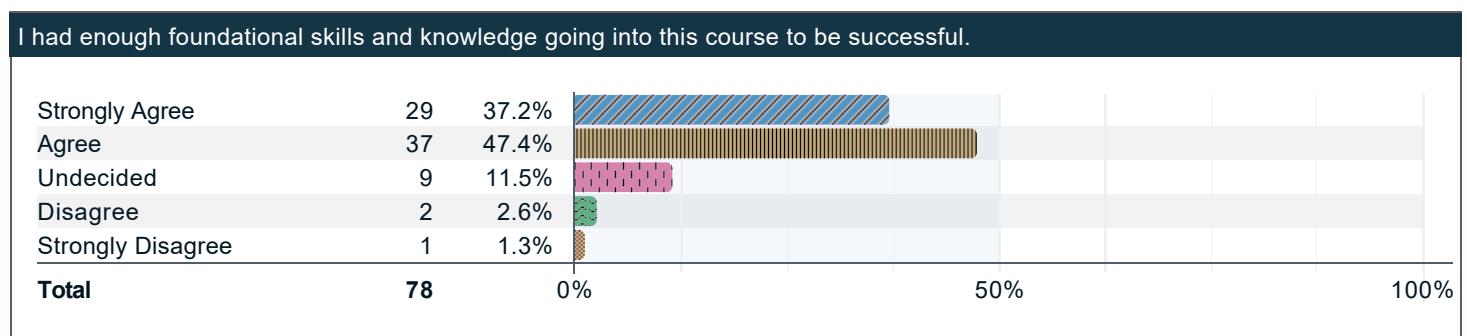
Sincerely,

UCalgary Course Survey Team

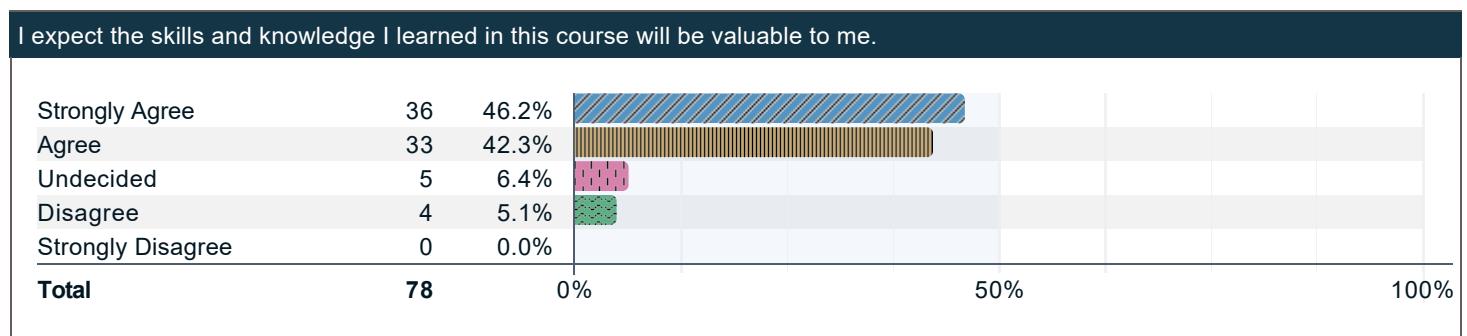
Creation Date: **Wednesday, January 15, 2025**

Course Feedback

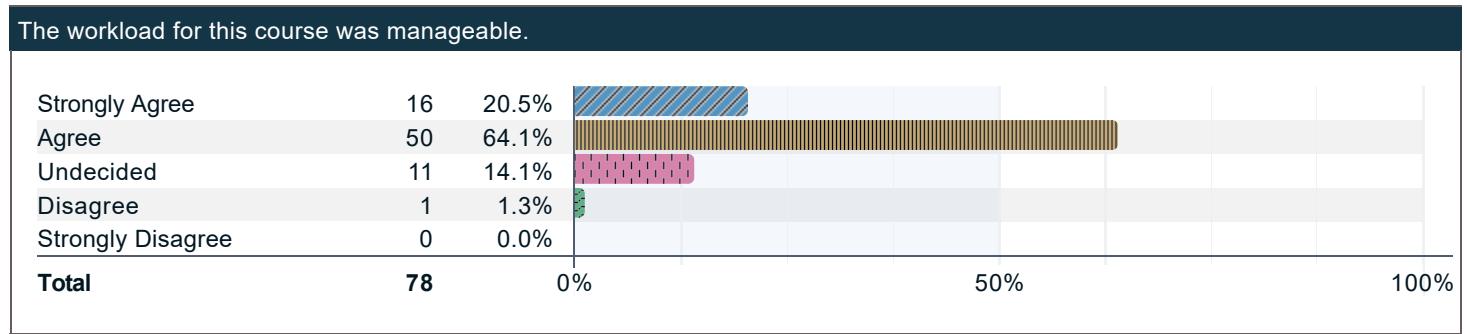
I had enough foundational skills and knowledge going into this course to be successful.



I expect the skills and knowledge I learned in this course will be valuable to me.



The workload for this course was manageable.



What aspects of the course were least helpful to your learning? Please elaborate if possible.

Student Comments
The Lyryx engage was somewhat helpful however some of the questions were very wordy and my peers and I would just guess the answers until we got them right. I think it would help if it showed you what you got wrong and right when you submitted the question.
Some of the videos I find could be hit or miss. I think attending in person lectures would clarify a lot of the videos.
The video lectures were fast, often providing only a quick reading of the slides. In addition, the video examples were pre-written, making it harder to follow along than if the lecturer did the examples at a natural pace. As a result, I frequently had to pause the video to keep up with the examples.
I never once opened the given textbook.
Studio Sessions should not be every week.
The lyrynx engage app did not feel useful to my learning as the questions were very abstract and tedious. They did not relate too closely to the lyrynx assignments or the exam questions in my opinion. There was still some value to them but I think my learning would have benefited from not having them.
The Lyryx engage section was tedious and time consuming, and it didn't feel particularly helpful compared to the studio session

Student Comments
worksheets or the main Lyryx assignments.
The online videos are not really helpful for some of the concepts(not explained well) plus we should have more lectures to cover the content in the class. Active learning is always better than passive learning
I felt the in-class lectures were more similar to office hours and became redundant since we learned the course material over the weekend., however they were helpful if a more abstract concept was difficult to understand.
The online lectures were hard to understand near the end of the course. As we dove into more complex topics, it became more prevalent that the structure of the online videos lacked formatting and the way that complex material was explained didn't fully follow through. However, with the online lectures combined with in-person tutorials, it slowly came together. I think it's possible to speed up this understanding process if the lecture videos were more proficient.
One aspect I did not find helpful was some of the Lyryx Engage assignments. While the majority of those assignments were beneficial, some topics felt out of place. They were never taught in the lecture videos and were not particularly useful in completing the Gradescope and other Lyryx assignments (Lab). For example, the terminology of null space and image space were never used in lectures or in-class worksheets.
The online lecture videos seemed very redundant and complicated. Perhaps I'm not used to the form of notes being presented, but I feel I am always needing to seek external resources to grasp the basics of the topics being presented before being able to absorb any information presented in the video lectures. In the last few weeks of the course I found it much more effective, and efficient, to read to the notes on my own, completely ignoring the videos, and searching external resources for explanations about the content in the slides. I quickly realized this was much less time consuming and I retained the information much better than passively watching the videos I could hardly understand.
The poorly structured time for lyrx engage. There was either way too much time for insufficient time
Everything helped me in my learning in different ways and they all helped me learn.
N/A
Personally, I found the video lectures to be slightly unhelpful in completing the associated quizzes provided at the end of the videos. I found that the videos did not explore all of the methods and skills necessary to solve, or even begin to understand, the questions given in the quizzes. For the future, I would appreciate if the videos were more focused on the methods necessary to solve the questions.
The quiz solutions were not very visible for students to understand what they did wrong.
They were all pretty helpful, cant pick one.
Textbook
Can't say there is any aspect that feels useless or anything, but I felt that the quizzes for the weekend videos didn't really help me all that much.
I did not like how the Lyryx homework assignment questions changed each time a new attempt was made. If I spent a lot of time doing a question, but I got it wrong, I would have to start from the beginning with new numbers. This was especially difficult when we were doing Row Reduced Echelon Form questions.
Also, I was very confused when we learned linear span, bases, and subspaces. After week 9, there was more and more topics covered in class that I did not understand because I couldn't even understand the basics. I tried asking people for help but I was still confused. The videos for those topics have too much theory and not enough examples with numbers. I understand theory is needed, but it makes it very hard to understand what the concepts (bases, span, subspaces, linear independence, etc) mean.
The lyryx engage app was a lot of work, super confusingly worded, and not all relevant to the material covered in this course. Also one question was bugged and does not ever mark us correct. Personally, the majority of engage was a waste of time reading over-complicated information just to guess the answer until I got it right. A few sections were genuinely helpful, but for the most part this was pointless.
The videos were long and confusing, very abstract. I would watch two 30 minute videos and gain nothing but confusion to then have the same topic summarized simply and concisely in a 10 minute youtube video.
Poor explanation of concepts in prerecorded online lecture videos.
the inperson lectures
The in person lectures were not very helpful as they just reiterated the mandatory videos
The videos are not very well explained.
The monday/tuesday lecture, felt almost useless after the online videos, it was just a couple of examples, which could be occasionally helpful, but I think that it would be better to either have 2 lectures instead of one and no videos, or just videos.
The lecture videos for every week were fairly detailed and easy to track through.
Lyryx notes were hard to follow.
Self-teaching with the online lectures. Though they were convenient, I felt that the person reading was just reading the slides, and I

Student Comments
honestly stopped watching the videos and just went off the slides after a couple weeks.
N/A
For me the quizzes helped me a bit but out of everything they were the least helpful, while they helped me see what I am expected to see the week ahead other than that I did not find it the most helpful with my learning journey in this course.
The videos are not helpful at all and very over complicated. To understand the content you must do your own research ESPECIALLY if you are a visual learner. You will be hopeless if you only watch the videos.
I was able to gain more deep knowledge in matrix
The assingment
quizzes
I believe the Lyryx Engage and the Lyryx Homework questions could've been a bit more integrated with each other, which could mix some of the Engage content with some of the homework questions, as well as reduce some of the large volume of Engage questions.
In think all aspects of this course was importantand helpful for the foundational knowledge and understanding concepts.
The LRYRX engage, the lessons there was not helpful so I just had to guess a lot for the check box stuff
Lyryx Engage, most of the time it will be half a page of reading, then questions barely related to the reading. It was also annoying when you got a question wrong, and the options reset themselves.
The fact that we were unable to access quiz marks for a while until students pressured the course coordinator. I also feel like we should have had access to explanations to the answers to the quizzes—if you did it wrong, but didn't know why or how the correct answer was chosen, you were not really learning.
No additional input
The lecture videos. A few of them didn't go over enough examples, and had too much theory without splitting it up into examples.
I can't really think of anything off the top of my head that was not helpful towards my learning in this course.

What aspects of the course were most helpful to your learning? Please elaborate if possible.

Student Comments
Instructor and TAs were easy to talk to which made learning the content easy.
I found the lectures to be very well conducted and the Lyryx homework assignments were good for mandatory practice.
The lyryx engage and assignments were very helpful
The lectures were great! They offered review of the videos, alternate methods, and new concepts—all at a good pace. Students felt comfortable asking questions during the lecture and Dr. Knapp gave helpful responses, checking whether he answered the student's question in a way that made sense to them. In addition, the studio sessions provided good practice and an opportunity to collaborate with others to strengthen our understanding of the lecture content. They also acted as additional office hours, as Dr. Knapp was very approachable for questions. The Lyryx Engage questions were great for practicing and reinforcing theoretical concepts, particularly before exams.
The weekly studio session worksheets were great as they allowed me to collaborate with others in the class to work on problems, and TAs were readily accessible to help.
The Lyryx online assignments were the most helpful for my learning.
The lyrynx assignment questions, weekly videos and quizzes and studio sessions all felt very crucial to my learning and development in the course. I really enjoyed that the videos explained the topics and provided examples that later came up. As well, I appreciated the weekly D2L quizzes to keep me on top of the course material so that even during midterm season, I did not fall too far behind. The studio sessions definitely reinforced concepts, and allowed me time to ask my instructor questions in a good environment.
I found the format of the studio session worksheets to be very beneficial, as there were only 2 questions but they were difficult and applied multiple skills from the week's lectures. The collaborative element of the studio sessions made it easier to understand and remember difficult concepts.
Lectures and active learning studio sessions are best to learn this course and participate actively. Lyrnx engage is also a great platform to study for exams
Everything was well centered around the topics at hand, it was a good balance of collaboration and individual work.
lots of mandatory practice
The 1 hour in person lecture sessions we had were extremely helpful because our professor was able to clearly explain examples and clear up discrepancies or complex topics from the videos earlier in the week.

Student Comments
I found the 5 Lyryx Lab assignments (not Engage) and practice midterms and finals to be the most useful as they gave me an understanding of expected questions.
I appreciated the weekly quizzes because it forced me to understand and apply the material learnt in the weekly lecture videos, however I wish the quizzes were not for marks during the week before exams because it caused extra stress.
Asking Professor Knapp any questions, whether it be during lectures, studio sessions, or even in the hall was a wonderful experience. Professor Knapp clarified the concept well, applied it to the question in a simple manner, and reclarified in the end, before asking if there was any confusion to ensure that students understood the concepts properly.
The Videos and Lecture. The lecture clarified many questions I had
The most helpful was the worksheets from the studio sessions which challenged me and made me have a better undersatnding on the content
N/A
The studio sessions, both the worksheet and lyrynx engage app, were very helpful in applying and practices the methods taught throughout the course.
I felt like the lyryx assignments helped my understanding of the practical aspects of the course.
I liked the assignments a lot, helped iron out some of my skills with linear algebra.
Engage app
The Lyryx Engage and Homework questions made me realize what areas I am lacking on.
I liked how helpful my course coordinator, professor, and TAs were. I also liked how there was a three day grace period for the Lyryx homework assignments. My professor was always friendly, patient, and respectful when answering my questions. If I asked him a question about the studio session worksheets, he wouldn't just give me the answer but instead he would help me understand what the question was asking, what I know about the question, and how the question connects to what we learned that week. He also made sure I understood what he was saying before he finished talking to me which I appreciated because it showed me that he cared that I understood what I was learning.
I was super confused why we started with complex numbers, the appendex of the lyryx textbook, when the semester started. But I understood when in both math 211 and engg 225 they became super important and having that foundation was useful.
Instructor Knapp was able to clearly show us difficult examples and created an environment in which I wanted to learn and felt I could ask questions to improve my understanding. He implemented feedback from the block representatives and it felt like he really cared about our learning. Mr. Knapp made Math 211 my favourite course so far.
The studio sessions had very helpful TA's and manageable worksheet problems which were most helpful. The lecture also helped to shed some light on confusing topics, although not completely.
Strong reinforcement of concepts in both in class lectures, studio sessions and online assignments
The in-person lectures were highly beneficial for educational purposes, as was the Lyryx Engage app and the weekly quizzes.
studio sessions
Having unlimited access to course and lecture content online
Greg Knapp's Lectures explained the content really well and the studio sessions were very helpful in allowing me to practice the material.
I believe the studio sessions were very helpful for assessing my grasp on the weeks subject, this was far better than the lectures themselves, and I would like to see more of these studio sessions.
The assignments for the course were really good practice and I learnt better.
the lecture every week and the active learning studio session. We will have a little warm up and learn some technique during leture, which is very helpful to review. For the studio session, we are solving the questions individually first and work out in a group, which brings us great collaboration and different ways to deal with the problems.
The lyryx assignments and the answers provided.
Definitely the Lyryx engage and the sessions where Dr. Knapp would explain more in depth explanations of certain topics. Honestly, those sessions could be longer.
Complex numbers
The Studio sessions really helped me understand and allowed me to see if I understood everything throughout the week and if I didn't the instructor and the TA's really helped me understand what is going on which helped me realized what I need to do as a student which might have not been possible if I did not have these studio sessions.
The instructor was the most helpful resource by far, he made sure he answered students questions thoroughly and provided very helpful examples.
The class and the studio session were a great help to me

Student Comments
The instructor is the beast part of this course
Active learning
The weekly quizzes helped make sure i was caught up in the course and ensured I had at least a bit of practice each week with the relevant material. Also the in class review and practice questions in the lectures from Greg were always helpful and cleared up any questions I ever had.
The lyryx engage app really helped me understand the concepts of linear algebra more deeply
Lyrex engage app with extra extra explanation and questions on basic concepts
Everything (Lyryx, lectures, textbook, notes, etc) were really helpful in trying to understand this abstract math and why it makes sense.
The LRYRX paid assignment was helpful in a way for practice problems
I liked the video, as the lady was good at explaining things. I liked this because given linear algebra is new to me, watching the concepts a few days before next week's lectures is very helpful.
The professor and the TA's were always open to questions, they were understanding and most importantly they were approachable. The lectures led by Professor Knapp were practically essential to my learning and provided a better foundation for understanding concepts of linear algebra. All his examples were extremely useful during our studio sessions. The way he structured his lessons was the most helpful to my learning.
No additional input
Dr. Knapp's in-person lectures. His teaching style as I explained before was very effective (even though he was limited to 2 hours a week).
I feel like in my opinion the part of the course that was most helpful to my learning was definitely the lyrix engage and assignments because though I could learn and take notes on all of the information, lyrix engage and our assignments allowed me to actually figure out for myself how to apply the learned concepts to problems. These helped me a ton to figure out how to solve many of our in class worksheet problems.

Please provide additional information for any of your answers above.

Student Comments
Greg Knapp was very good at teaching us in the lectures and communicating with us important information outside of lectures
The Lyryx Engage synchronization could have been better. Sometimes the Lyryx website or D2L would not update when they were supposed to, creating extra stress as the deadline approached at the end of the semester.
The assignments for this course requires additional payment of \$40 to access remotely when that could have been easily done through any other unpaid platform like(webwork for 275). I believe it is unfair to students to make them pay even a single dollar extra when they have already paid the course fee. I heard of other universities around the world that provide free access to study material rather than forcing students to pay extra.
Professor Knapp is an awesome instructor and was very good at explaining and making sure everyone understood the material.
N/A
I'm pretty happy with how this course is taught.
N/A
3Blue1Brown's Youtube videos were extremely useful for my understanding of Linear Algebra. One of the TA's recommended them to me, and I think everyone in the course should know about them.
n/a
Greg was always very understanding and helpful as an instructor and I appreciate both his patience and welcoming attitude, I know it really affected how motivated I was to learn the content, and many of my peers who I conversed with also agreed.
I also liked the quizzes, as they weren't too hard. The worksheets were also good, as they weren't too long.
The workload in this course was manageable. It was the necessary amount for you to understand the concepts.
No additional input