

Teaching Portfolio for Dr. Andrea Welsh

Last updated: 10/28/2025

Table of Contents

Teaching Portfolio for Dr. Andrea Welsh Last updated: 10/28/2025	1
Summary of Courses Taught and Subjects Tutored	4
Courses taught as an instructor:	4
Courses as a teaching assistant:	4
One-on-one (or 2 on 1) tutoring for the following courses from 2012-2020	4
Additional Notes	5
Instructor at Texas A&M University, Department of Mathematics	6
Course Descriptions, Topics, Teaching Duties	6
MATH 151: Honors Engineering Math I	6
MATH 152: Engineering Math II	7
MATH 308: Differential Equations	8
Courses Taught, Number of Students, Response Rate	9
Survey Questions and Scores.....	10
Student Feedback as an Instructor	11
MATH 151: Honors Engineering Math I, (202) Fall 2025.....	11
MATH 151: Honors Engineering Math I, (206) Fall 2025.....	11
MATH 151: Honors Engineering Math I, (207) Fall 2025.....	11
MATH 152: Engineering Math II, (555) Spring 2025.....	11
MATH 152: Engineering Math II, (556) Spring 2025.....	12
MATH 152: Engineering Math II, (557) Spring 2025.....	13
MATH 308: Differential Equations, (511) Fall 2024.....	14

MATH 308: Differential Equations, (512) Fall 2024.....	16
<i>Instructor at University of Pittsburgh, Department of Mathematics</i>	<i>19</i>
Course Descriptions, Topics, Teaching Duties	19
MATH 220: Analytic Geometry & Calc 1	19
MATH 280: Intro to Matrices and Linear Algebra	19
MATH 290: Differential Equations	20
MATH 1180: Linear Algebra 1	20
MATH 1270: Ordinary Differential Equations 1	21
Courses Taught, Number of Students, Response Rate	21
Survey Questions and Scores.....	22
Student Feedback as an Instructor	23
MATH 1270: Ordinary Differential Equations 1, Spring 2024	23
MATH 280: Intro to Matrices and Linear Algebra, Fall 2023	25
MATH 1180: Linear Algebra, Spring 2023	28
MATH 220: Analytic Geometry & Calc 1, Fall 2022	29
MATH 290: Differential Equations, Spring 2022	31
MATH 220: Analytic Geometry & Calc 1, Fall 2021	32
MATH 290: Differential Equations, Spring 2021	34
MATH 290: Differential Equations, Fall 2020	36
<i>Teaching Assistant at Georgia Institute of Technology, School of Physics</i>	<i>38</i>
Course Descriptions and Topics	38
PHYS 2211: Intro Physics I	38
PHYS 3266 Computational Physics	38
Courses Taught, Number of Students, Response Rate	38
Survey Questions and Scores.....	39
Student Comments and Feedback:	39
PHYS 3266, Computational Physics Spring 2015.....	39
PHYS 2211, Intro Physics C03 Spring 2013.....	40
PHYS 2211, Intro Physics C04 Spring 2014.....	40

<i>Teaching Assistant at University of Texas – Austin, Department of Mathematics</i>	<i>41</i>
Course Descriptions and Topics	41
M408L: Integral Calculus, Fall 2011	41
Courses Taught, Number of Students, Response Rate	41
Survey Questions and Scores.....	41
Student Comments and Feedback	41
M408L: Integral Calculus, Fall 2011	41
<i>Private Tutoring Profile and Feedback.....</i>	<i>41</i>

Summary of Courses Taught and Subjects Tutored

Courses taught as an instructor:

- Math 151: Honors Engineering Math I (Texas A&M University, Math, 2 courses)
- Math 152: Engineering Math I (Texas A&M University, Math, 1 course)
- Math 308: Differential Equations (Texas A&M University, Math, 2 courses)
- Math 0220: Analytic Geometry & Calculus 1 (University of Pittsburgh, Math, 2 courses)
- Math 0290: Differential Equations (University of Pittsburgh, Math, 3 courses)
- Math 1180: Linear Algebra 1 (University of Pittsburgh, Math, 1 course)
- Math 1270: Ordinary Differential Equations 1 (University of Pittsburgh, Math, 1 course)
- Computational Physics (Georgia Institute of Technology, Physics, multiple lectures, worked on developing a syllabus with Prof Flavio Fenton)

Courses as a teaching assistant:

- M408L: Integral calculus (University of Texas – Austin: Math, 1 semester)
- Phys 2211: Intro Physics: mechanics (Georgia Institute of Technology, Physics, 2 semesters)
- Phys 3266: Computational Physics (Georgia Institute of Technology, Physics, 1 semester)

One-on-one (or 2 on 1) tutoring for the following courses from 2012-2020

- high school physics
- AP Physics B & C
- college physics I & II
- pre-algebra
- algebra pre-calculus
- AP Calculus
- differential calculus,
- integral calculus
- differential equations,
- SAT Math prep
- ACT Math prep
- quantum mechanics

- linear algebra
- high school chemistry

Additional Notes

1. Completed level 1 of Georgia Tech's Tech to Teaching program i.e. Foundations of Teaching and Learning. From the website: "The Tech to Teaching program is designed to prepare Georgia Tech graduate students and postdocs for college teaching positions. Through this certificate program, participants will develop a thorough understanding of the scholarship of teaching and learning, and will demonstrate their ability to apply these skills in the classroom." This program involved teaching observations, working with a teaching mentor, and coursework on teaching at the college level. As part of this, I was a guest lecture in Computational Physics "Computational Physics", Spring 2015, 2 Lectures on Chaos and Nonlinear dynamics, 2 Lectures on Arduino Programing
2. Received an award from the American Association of Physics Teachers in 2015 for "Outstanding Teaching Assistant"
3. Additionally, was a guest lecture for the following:
 - a. Georgia Tech "Introductory Physics I," Spring 2020, 1 Lecture on Circular motion
 - b. Georgia Tech, "Computational Physics," Spring 2019, 2 Lectures on Arduino Programing
 - c. Loyola University New Orleans, Spring 2019, "Introduction to Electromagnetism"
 - d. ITT Tech, Kennesaw, GA, "Calculus II" December 2014-January 2015

Instructor at Texas A&M University, Department of Mathematics

Course Descriptions, Topics, Teaching Duties

MATH 151: Honors Engineering Math I

Description: MATH 151 Engineering Mathematics I (MATH 2413), Rectangular coordinates, vectors, analytic geometry, functions, limits, derivatives of functions, applications, integration, computer algebra.

Topics: This course focuses on quantitative literacy in mathematics along with real world applications to physics, related rate problems, and optimization. Upon successful completion of this course, students will be able to:

- Understand vectors and vector functions, both graphically and quantitatively, and apply them to real world situations involving velocity, forces, and work.
- Construct vector and parametric equations of lines and understand vector functions and their relationship to parametric equations.
- Understand the concept of a limit graphically, numerically, and algebraically, and apply the relationship between limits, continuity, and differentiability in determining where a function is continuous and/or differentiable.
- Define the limit definition of the derivative and calculate derivatives using the limit definition, differentiation formulas, the chain rule, and implicit differentiation, with applications to tangent line and velocity problems.
- Calculate limits and derivatives of vector functions with applications to physics such as computing velocity and acceleration vectors.
- Identify exponential, logarithmic, and inverse trigonometric functions, and compute limits and derivatives involving these classes of functions.
- Apply the derivative to mathematically model velocity and acceleration as well as real world related rate applications, such as calculating the rate at which the distance between two moving objects is changing or the rate at which the volume of a cone being filled with water is changing.
- Approximate functions and function values using the derivative and the tangent line.
- Identify and understand indeterminate forms and apply the derivative to calculate limits using L'Hôpital's Rule.
- Understand and apply the Intermediate Value Theorem and the Mean Value Theorem and be able to logically determine when these theorems can be used.
- Use calculus and logic to sketch graphs of functions and analyze their properties, including where a function is increasing/decreasing and in describing the concavity of the function.

- Determine the maximum/minimum values of functions, including applied optimization problems.
- Compute antiderivatives and understand the concept of integration as it relates to area and Riemann sums.
- Articulate the relationship between derivatives and integrals using the Fundamental Theorem of Calculus, and evaluate definite integrals using the Fundamental Theorem of Calculus.
- Use a Computer Algebra System to solve problems.

Duties: Prepping lectures, write quizzes, write quiz solutions and rubric for TAs, write additional homework assignments, write solutions and rubric for TAs, write weekly bonus assignments, write rubric for weekly bonus assignments, write midterm exams, grade midterm exams, write final exam, grading final exam, holding office hours, helping with Webassign homework assignments, help with weekly python lab assignments, participate in weekly Math 151 coordination meetings,

Notes: This course was a partially coordinated course. We followed the same schedule as the non-honors sections with the same Webassign assignments, same python labs, and same python quizzes, but the honors sections had more work from the students. This included a weekly written homework assignment students would turn in and weekly recitation work they could turn in. Lectures did fewer examples than the non-honors and instead did more proofs and applications. The honors courses had different exams that I wrote myself and were all free-response problems except for a required python problem. Students were typically non-math majors (engineers) and this was required for their degree. Most students were first semester freshman who have taken AP Calculus before, but lectures were taught as if they were seeing the material for the first time.

MATH 152: Engineering Math II

Description: MATH 152 Engineering Mathematics II (Math 2414) Differentiation and integration techniques and their applications (area, volume, work), improper integrals, approximate integration, analytic geometry, vectors, infinite series, power series, Taylor series, computer algebra.

Topics: This course is focused on quantitative literacy in mathematics as applied to Engineering and Physics. Upon successful completion of this course, students will be able to:

- Use the concepts of definite integrals to solve problems involving area, volume, work, and other physical applications.
- Use substitution, integration by parts, trigonometric substitution, and partial fractions to evaluate definite and indefinite integrals.
- Apply the concepts of limits, convergence, and divergence to evaluate different types of improper integrals.

- Determine convergence or divergence of sequences and series.
- Use Taylor and MacLaurin series to represent functions and to integrate functions not integrable by conventional methods.
- Use parametric representations of curves to find arc length and surface area.
- Understand and use polar coordinates to represent curves and to find areas of polar regions.

Duties: Prepping lectures, write quizzes, write quiz solutions and rubric for TA, creating final exam, grading final exam, holding office hours, helping with Webassign homework assignments, help with weekly python lab assignments, participate in weekly Math 152 coordination meetings, give feedback on coordinated midterm exams, copy editing coordinated midterm exams, grading coordinated midterm exams.

Notes: This is a coordinated course where all sections had the same three midterm exams and same schedule of lectures. Finals were required to have most of the same questions except for a small percentage that was left up to the instructor. There was a python component that had required labs and quizzes. Lectures were focused primarily on examples. Students were typically non-math majors (engineers) and this was required for their degree.

MATH 308: Differential Equations

Description: This is a course in differential equations. Topics include linear ordinary differential equations and systems of linear differential equations, second order linear equations, solutions using Laplace transforms, solutions by power series, and elements of nonlinear systems.

Topics: Upon successful completion of this course, students will be able to:

- use differential equations to model mechanical and electrical systems;
- visualize solutions to first order differential equations and 2×2 systems of first order linear differential equations using direction fields and phase planes;
- solve basic first order differential equations and initial-value problems;
- understand the conditions required for a first order differential equation to have a unique solution;
- find the equilibrium points of an autonomous differential equation and determine their stability;
- solve homogeneous second order linear differential equations and initial value problems with constant coefficients;

- use the methods of undetermined coefficients and variation of parameters to find solutions to nonhomogeneous second order linear differential equations and initial value problems with constant coefficients;
- use Laplace transforms to solve basic initial value problems;
- determine the mathematical and practical effect of step functions and impulse functions on second order linear initial value problems with constant coefficients;
- use power series to solve second order linear differential equations;
- write a higher order differential equation as a system of first order equations;
- solve homogenous systems of first order linear differential equations;
- conduct qualitative analysis of 2×2 and 3×3 systems of linear first order differential equations with constant coefficients;
- understand methods of numerically approximating solutions to first order initial value problems.

Duties: Prepping lectures, write homework sets, write homework set solutions and rubric for TA, writing two midterms which would be approved by the coordinator, grading midterm exams, creating final exam to be approved by the coordinator, creating two python assignments as a required component of the course, grading python assignments, grading final exam, holding office hours, participate in monthly MATH 308 coordination meetings.

Notes: This course was mostly non-major STEM students taking it for their degree as a sophomore or junior. This was semi-coordinated and so there was little flexibility in how the course was run, however assignments were mostly up to the instructor with approval.

Courses Taught, Number of Students, Response Rate

- MATH 151: Honors Engineering Math I, Fall 2025.
 - Section 201: 16 students,
 - Section 202: 22 students,
- MATH 151: Honors Engineering Math I, Fall 2025.
 - Section 206: 21 students,
 - Section 207: 20 students,
- MATH 152: Engineering Math II, Spring 2025.
 - Section 555: 29 students, 24% response
 - Section 556: 29 students, 28% response
 - Section 557: 27 students, 22% response

- MATH 308: Differential Equations, Fall 2024. 64 students, 22% response
- MATH 308: Differential Equations, Fall 2024. 60 students, 32% response

Survey Questions and Scores

1-5 Likert Scale with 1 being Strongly Disagree and 5 being Strongly Agree

1. The instructor fostered an effective learning environment.
2. My instructor explained concepts clearly.
3. My instructor was receptive to students asking questions in this class.
4. My instructor was available outside of class.
5. My instructor fostered a learning environment that was respectful of all students.
6. Overall, my instructor was effective.
7. I would recommend my instructor to another student.

	1.	2.	3.	4.	5.	6.	7.
Honors Engineering Math I, 201 (Fall 2025)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Honors Engineering Math I, 202 (Fall 2025)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Honors Engineering Math I, 206 (Fall 2025)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Honors Engineering Math I, 207 (Fall 2025)	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Engineering Math II, 555 (Spring 2025)	4.71 $\pm$ 0.45	4.57 $\pm$ 0.49	5.00 $\pm$ 0.00	4.86 $\pm$ 0.35	4.86 $\pm$ 0.35	4.71 $\pm$ 0.45	4.71 $\pm$ 0.45
Engineering Math II, 556 (Spring 2025)	4.75 $\pm$ 0.43	4.75 $\pm$ 0.43	5.00 $\pm$ 0.00	4.75 $\pm$ 0.43	4.88 $\pm$ 0.33	4.75 $\pm$ 0.43	4.75 $\pm$ 0.43
Engineering Math II, 557 (Spring 2025)	4.67 $\pm$ 0.47	4.83 $\pm$ 0.37	4.83 $\pm$ 0.37	4.83 $\pm$ 0.37	4.83 $\pm$ 0.37	4.67 $\pm$ 0.47	4.67 $\pm$ 0.47

Differential Equations, 511 (Fall 2024)	4.86 ± 0.35	4.79 ± 0.41	4.85 ± 0.53	4.79 ± 0.41	4.92 ± 0.27	5.00 ± 0.00	4.93 ± 0.26
Differential Equations, 512 (Fall 2024)	4.74 ± 0.44	4.74 ± 0.55	5.00 ± 0.00	4.74 ± 0.44	4.95 ± 0.22	4.63 ± 0.74	4.79 ± 0.41
Average	4.75	4.74	4.94	4.79	4.89	4.75	4.77

Student Feedback as an Instructor

MATH 151: Honors Engineering Math I, (201) Fall 2025

MATH 151: Honors Engineering Math I, (202) Fall 2025

MATH 151: Honors Engineering Math I, (206) Fall 2025

MATH 151: Honors Engineering Math I, (207) Fall 2025

What did your instructor do that you found particularly helpful?

What would you recommend that your instructor change?

What, if anything, could your instructor have done to better facilitate your learning in this course?

Please add your overall thoughts on the course and instructor.

MATH 152: Engineering Math II, (555) Spring 2025

Provided LOTS of office hours for students to ask questions about material and always recorded lectures so you could rewatch parts if you missed it in class or needed it explained again. Material was always presented in a way that was easy to follow. After practicing material, I could always go back and see the process and it was clear where I was making a mistake.

The office hours were very helpful. I cannot stress enough how helpful these were. I do not think I would be doing as well without the chance to ask questions in office hours

What did your instructor do that you found particularly helpful?

1. I believe that she went over content very well and gave good feedback on all our exams.
2. I thought the way information was presented in class was very helpful. Having it written out and recorded was nice.
3. Having good office hours, posting recordings of the lectures to go back and review, posting notes as well

What would you recommend that your instructor change?

1. Maybe make a template for the notes rather than writing every single detail on the board.
2. I can't really think of anything I would recommend changing. All the things that Dr. Welsh could do were done well and were helpful.

What, if anything, could your instructor have done to better facilitate your learning in this course?

1. I believe that there is nothing else that she can do better in terms of teaching this course.
2. N/A

Please add your overall thoughts on the course and instructor.

1. I believe that this course is stupidly difficult than it needs to be; The amount of work and assignments given on top of other classes makes this one of the hardest course I have ever taken. Thankfully, the instructor that I was fortunate to have made this course more bearable however, I deemed it useless to go to class after the third exam.
2. Despite the content being tricky at times I always knew that help wasn't far away. I can confidently say that my poor performance on the first 2 tests was my error, and the feedback provided by Dr. Welsh allowed me to fix it moving forward. The skills I learned in this class are skills I know I will use for years to come, so I am abundantly thankful that they were taught in such an easy to follow manner. I also enjoyed when Dr. Welsh would take the little extra time to explain WHY something worked the way it did rather than leaving students with a "that is that. Memorize it." This made the content a lot less scary because I was able to understand a little more on the why things work or are done the way they are. All in all, a wonderful professor and a terrific TA that both made a hard math class much more manageable.
3. Tough course but Professor Welsh makes it manageable [*sic*]

MATH 152: Engineering Math II, (556) Spring 2025

What did your instructor do that you found particularly helpful?

1. They were always willing to answer questions, providing or making time for students to work out problems, derive concepts, etc. Even when I didn't always need the extra assistance, knowing Dr. Welsh was available if I needed the help was very comforting.

What would you recommend that your instructor change?

1. If possible, having the example problems we cover in class provided ahead of time would be nice. I occasionally felt a bit rushed when trying to write down the problem as we were doing it.

What, if anything, could your instructor have done to better facilitate your learning in this course?

*There were no responses from this section

Please add your overall thoughts on the course and instructor.

1. Dr. Welsh is awesome and was super helpful for me this semester!
2. Thank you Dr. Welsh for a great semester. You're a fantastic professor and always willing to help support us in our learning. Even if we don't say it all the time, please know that we are thankful and appreciative of all that you've done for us. I hope you have a wonderful summer.
3. I went to office hours at least once a week for most of the semester and never had any issues getting help.
4. Dr. Welsh would go out of the way to make sure to answer any questions in class
5. I really liked how professor Welsh taught lecture. The way she took notes and explained concepts made it very easy to understand topics
6. Went to office hours and she helped me go from getting a 55 on Exam 2 to a 91 on Exam 3. Dr. Welsh was super helpful and given the opportunity I will 100% take her class again!
7. She was very friendly in class and in office hours and explained concepts very simply
8. Dr. Welsh was extremely helpful to me this semester!

MATH 152: Engineering Math II, (557) Spring 2025

What did your instructor do that you found particularly helpful?

1. I love how Professor Welsh delivers the material and introduces the concepts to us. She starts out her notes with clearly explaining the process and what we are learning prior to going into practice problems applying the concepts. I also enjoy how the lectures are recorded, the few times I wasn't able to make it to the scheduled class I could still be caught up and not feel behind. Additionally, she offers an abundance of office hour times which I have found to be very helpful.
2. Super easy to reach out to and answer emails well. They also were very respectful, kind, and non-judgemental during office hours.

3. She spent more time on topics which students struggled with.

What would you recommend that your instructor change?

1. This isn't a professor-specific change, but I think there should be able to have some type of partial credit on some of the multiple choice problems.
2. Perhaps doing hand written notes. Having some sort of a notes packets would save time in class. As a slow writer and perfectionist, I found myself missing parts of the questions or explanations so my notes usually have big gaps in them that I have to fill out by going through notes again.
3. get exam grades in gradescope
4. N/A

What, if anything, could your instructor have done to better facilitate your learning in this course?

1. Nothing, she was absolutely amazing.
2. use gradescope for exams
3. N/A

Please add your overall thoughts on the course and instructor.

1. I absolutely loved it!
2. Good prof, who is caring, respectful, and can answer questions well. Whenever someone asked questions, they made sure they answered their question and that we had no confusion.

MATH 308: Differential Equations, (511) Fall 2024

What did your instructor do that you found particularly helpful?

1. Dr. Welsh made themselves extremely accessible in office hours, and any time multiple students had similar questions, would create sets of study material to review topics.
2. She actually knew how to teach. Homeworks also provide a good amount of examples for the content we learned that week or the week before.
3. Offered many supplemental lectures to help in more difficult areas of study

4. going out of their way to be available at various times throughout the week so everyone could make office hours, not assuming students already knew concepts from cal 2/3 or linear, posted in-depth notes and recorded lectures and canvas was very organized and easy to go back and review concepts, engaged with the class before and after lecture
5. although the class is "advertised" as an in person class she has a zoom session very class period for students who can/don't want to come to class. This also results in every class being recorded to view or review later.
6. The recordings were extremely helpful because we could review the content later if necessary.
7. Homework Solutions for checking work was very helpful. Posting the notes for each class period is amazing.

What would you recommend that your instructor change?

1. Nothing
2. Nothing
3. More consistent HW due dates and having the HW, HW sample solutions (if they are provided) and drop box open posted as soon as possible. Although I do feel all the due dates were clearly communicated, and enough time was provided for each assignment, I would personally prefer a more consistent schedule. i.e. HW always due Friday, and every thing needed for next HW opens Monday or something like that. (this is a very minor problem for me but it literal the only thing I would change)
4. It will be great to receive feedback on assignments and homework faster.
5. Nothing

What, if anything, could your instructor have done to better facilitate your learning in this course?

1. Nothing
2. Nothing
3. No

Please add your overall thoughts on the course and instructor.

1. Dr. Welsh was a phenomenal instructor for Differential Equations, in regards to meeting student needs, and in regards to presenting course materials
2. Overall, really knowledgeable and understanding prof. The only other comment I can say is that I wish there was a review for exam 1 the same way there was a review for exam 2 and maybe the final since the previous exams do differ in content.
3. Fantastic professor all around. Would recommend to anyone and deserves a raise.
4. It was effective and she was willing to help in whatever we needed.
5. Fantastic, no notes

What did your instructor do that you found particularly helpful?

1. Answer questions I had clearly and explained the material for the class flawlessly.
2. I thought the "simple solutions" helpful.
3. Gave 3 late homework passes that allowed me to focus on other classes during busy weeks.
4. The recorded lectures were very helpful for me, as well as the review resources she compiled in canvas for things outside the scope of the class (series review, calc review, etc). I also found the optional homework questions useful for studying.
5. I found that her homeworks were well designed to help us learn and expand what was taught in class.
6. I found her support and understanding of people's circumstances and willingness to support us when we were in need was unlike most other professors that I've had.
7. Gave prior exams, prompt emails, posting lecture notes, should something be defective/confusing in my own.
8. The instructor seemed to genuinely take a concern for the learning and wellbeing of her students.
9. She would ask how many students understood the concept that a topic built on before going over it, and would review if many students didn't know it. For example, going over matrix addition and multiplication before the eigenvectors lecture.
10. She provided all of the notes and video recordings for each class.
11. Post notes
12. Professor Welsh did an excellent job of explaining the intuition of particular methods and helped us build up our foundation by starting with easier problems and being able to tackle harder problems.
13. I found every topic was able to build off one another, and how they were able to separate each method into different categories and offer clear, detailed explanations [*sic*] for every concept. The organization in this course was wonderful and there was so many additional resources provided. Concepts were never a mystery and the examples provided in the lecture closely corresponded to the homeworks. Even challenging questions were able to be completed using the material [*sic*] given in the lectures and notes.
14. Dr. Welsh was extremely helpful during office hours and was very patient with her students, especially the ones who were struggling. It showed how much she cared about our success in this class.

What would you recommend that your instructor change?

1. Maybe be a little more organized (have homework thingys on Gradescope posted once homework is released)
2. Nothing much

3. I would recommend to go into more the reasoning why the math worked out. For instance, why lapacian [*sic*] transformations worked, or how we can multiple a differential to both sides.
4. N/A
5. Posting worked out solutions of the homework a week after it's due could be nice, but a low priority.
6. I think more frequent quizzes would be beneficial for concept reinforcement, instead of just having the one or two right before the exam. Additionally I feel that the python assignments were a bit confusing and unnecessary.
7. Having a template for the notes written and available means that students can spend more time thinking about the content instead of just rushing to copy down what's written on the screen. Solving it out live by hand is great for the examples, but not so much for the definitions and concepts.
8. I would recommend that the teacher have set problems to work on during class.
9. More example problems
10. I like the overall balance and structure of the course. I learned better from the instructor than the textbook.
11. I would recommend structuring the course similar to how Calculus is taught here. Have notes that the students print off and then fill them out together in class. That way the students have a little booklet that makes it easy to find information that they need to know. The pertinent information (formulas and definitions) are already written down, and they have to come to class or watch posted videos to fill in the rest. That way, you also only have to record and post the notes once for multiple semesters, as the information should stay the same that is being taught. I would recommend speaking with Joe Kahlig for a more in depth explanation.
12. Not enough practice- granted I didn't have the textbook, but still 5 homework assignments for exam one, 2 for exam two, and 3 for exam three, and a *multiple choice* quiz for each exam isn't a lot of volume. The old exams posted aren't adjusted to the different pacing of this school, making a lot of the questions irrelevant. But take that with a grain of salt; I really should've got the textbook that's on me

What, if anything, could your instructor have done to better facilitate your learning in this course?

1. Maybe
2. Nothing much
3. Nothing to do better.
4. N/A
5. Nothing besides have the grader be timely. The grader was so beyond delayed I question what use she was tot he class.
6. N/A
7. The teacher did a great job and I don't believe there was much else she could have done to better facilitate my learning.

8. N/A

Please add your overall thoughts on the course and instructor.

1. The course is difficult, but not the worse. You need to think a lot and it gives you a headache. The instructor is cool and explains the material clearly.
2. Very good instructor with a very clear way of explaining concepts.
3. Dr. Welsh is very accommodating and clearly cares about the success of her students. She gives extended feedback on every exam and is very helpful during office hours. Her explanations are clear, and at points where the class is confusing she often provides additional resources. I found her course fun even when it was difficult!
4. It was a good class.
5. For it being their first semester here, I was surprised by how their quality as a professor was miles better than those who have been teaching for almost/over a decade.
6. Very kind, effective teacher. The concepts are tough but the positive attitude helps.
7. Great instructor overall, very receptive to working with students and accommodating them while still ensuring they put in effort.
8. Overall this was a fun and challenging course.
9. Professor Welsh did an excellent job and her enthusiasm and energy really helped me learn the material. I would highly recommend Professor Welsh to anyone taking this course.
10. I initially found this course intimidating based on what I know of it previous, yet the professor was able to make it so this is one of the classes I feel better about going into finals. I enjoy the material and explanations [sic] given and I would strongly recommend another student for this course.

Instructor at University of Pittsburgh, Department of Mathematics

Course Descriptions, Topics, Teaching Duties

MATH 220: Analytic Geometry & Calc 1

Description: This is the first of a sequence of three basic calculus courses. It covers the derivative and integral of functions of one variable and their applications.

Topics: Limits, average velocity, instantaneous velocity, limit definition of derivative, finding derivatives, related rates, inverse functions, hyperbolic functions, optimization, curve sketching, anti-derivatives, Reimann sum, integration, u-substitution, integration by parts, integrating trigonometric functions.

Duties: Creating a syllabus, prepping lectures, preparing homework solutions for students to review, helping with LON CAPA technical issues, write quizzes, write quiz solutions and rubric, creating midterms and solutions, grading midterms, grading departmental final exams jointly, holding office hours, moderating class Discord for questions and help

Notes: This course is aimed at non-majors and was a required course for many majors on campus. It follows the same topics as other sections of this course and there is a joint final that all instructors grade together at the end of the semester. There is a recitation section and a lab section that TA run each week.

MATH 280: Intro to Matrices and Linear Algebra

Description: The principal topics which this course will cover include vectors, matrices, determinants, linear transformations, eigenvalues and eigenvectors, and selected applications.

Topics: The principal topics of the course include vectors, matrices, determinants, linear transformations, eigenvalues and eigenvectors, an selected applications.

Duties: Creating a syllabus, prepping lectures, preparing homework solutions for students to review, creating midterms and solutions, grading midterms, grading final exams, holding office hours, moderating class Discord for questions and help

Notes: This course is aimed at non-majors and was a required course for many majors on campus. It follows the same topics as other sections of this course and there is a joint final that all instructors grade together at the end of the semester. Homeworks were done with Webassign.

MATH 290: Differential Equations

Description: Differential equations are an important branch of mathematics. They have a rich mathematical formalization, as well as a very successful history of being applied to important problems in physics, chemistry, engineering, and biology. This course will introduce primarily linear, first and second order differential equations. Solution techniques for separable equations, homogeneous and inhomogeneous equations, as well as an intuition for modeling-based applications will be presented. The application of Laplace transforms to differential equations, systems of linear differential equations, linearization of nonlinear systems, and phase plane methods will be introduced. Fourier series and their application to simple partial differential equations will be treated. MATLAB based numerical solution and visualization will be briefly covered.

Topics: Ordinary differential equations, separable equations, first order linear inhomogeneous differential equations, Mixing problems, circuit problems, second order differential equations, harmonic motion, method of undetermined coefficients, Variation of parameters, forced harmonic motion, Laplace transforms, numerical methods, nullclines, vector fields, systems of differential equations, linear systems with constant coefficients, nonlinear systems and linearization, Fourier series, heat equation, separation of variables method for PDEs

Duties: Creating a syllabus, prepping lectures, creating homework problems, preparing homework solutions and rubrics for TA, creating midterms and solutions, grading midterms, grading departmental final exams jointly, holding office hours, moderating class Discord for questions and help

Notes: This course is aimed at engineers. Students were typically sophomores or juniors. It follows the same topics as other sections of this course and there is a joint final that all instructors grade together at the end of the semester

MATH 1180: Linear Algebra 1

Description: This is a core undergraduate course in linear algebra and matrix analysis for mathematics majors. The emphasis will be placed on the understanding of concepts and their application in further development of the theory. Specifically, the course covers topics such as solutions of linear equations, matrix algebra, linear transformations, orthogonality, general linear vector spaces, basis, dimension, and eigenvalues/eigenvectors. The grade will be based on evaluation of both problem solving and theorem proving skills.

Topics: geometry and algebra of vectors, linear combination, dot products, equations of lines and planes, cross product, systems of linear equations, Gauss-Jordan elimination, rank theorem, homogenous equations, spanning vector spaces, linear independence, matrices, matrix operations, spaces and subspaces, finding bases, linear transformations, eigenvalues,

eigenvectors, determinants, Laplace expansion theorem, similarity, diagonalization, numerical method for computing eigenvalues and eigenvectors, applications

Duties: Creating a syllabus including schedule of topics, prepping lectures, creating homework problems, preparing homework solutions and rubrics for TA, creating midterms and solutions, grading midterms, creating a final exam, grading final exams, holding office hours, moderating class Discord for questions and help.

Notes: This course is aimed at math majors. Students in my class range from freshman to senior. This was a proof-based course, and the syllabus was highly flexible. I decided to have exams have two portions: an in-class calculation based portion and a take home proof-based portion.

MATH 1270: Ordinary Differential Equations 1

Description: This course covers methods of solving ordinary differential equations which are frequently encountered in applications. General methods will be taught for single n -th order equations, and systems of first order linear equations. An introduction will be given to the qualitative theory of first-order nonlinear systems which includes phase plane methods and stability analysis.

Topics:

Duties: Creating a syllabus, prepping lectures, creating homework problems, preparing homework solutions and rubrics for TA, creating midterms and solutions, grading midterms, holding office hours, creating guidelines for projects

Notes: This course is aimed at math majors and more advanced non-math STEM students. Students were mostly juniors. In lieu of a final, I assigned a final project that had a computational component, a written component, and a presentation.

Courses Taught, Number of Students, Response Rate

- MATH 1270: Ordinary Differential Equations 1, Spring 2024. 45 students, 26.26% response
- MATH 280: Intro to Matrices and Linear Algebra, Fall 2023. 22 students, 36.36% response
- MATH 1180: Linear Algebra, Spring 2023, Spring 2023. 45 students, 26.26% response
- MATH 220: Analytic Geometry & Calc 1, Fall 2022. 75 students, 64.00% response
- MATH 290: Differential Equations, Spring 2022. 60 students, 56.67% response
- MATH 220: Analytic Geometry & Calc 1, Fall 2021. 72 students, 48.61% response
- MATH 290: Differential Equations, Spring 2021. 44 students, 50.00% response
- MATH 290: Differential Equations, Fall 2020. 71 students, 53.52% response

Survey Questions and Scores

1-5 Likert Scale with 1 being Strongly Disagree and 5 being Strongly Agree

1. The instructor created an atmosphere that kept me engaged in course content.
2. The instructor was prepared for class.
3. The instructor treated students with respect.
4. The instructor was available to me (in-person, electronically, or both).
5. The instructor evaluated my work fairly.
6. The instructor provided feedback that was helpful to me.
7. I learned a lot from this course. If there is no basis to judge or not applicable, answer
8. The instructor presented the course in an organized way.
9. The instructor responded to student's questions in an effective manner.
10. The instructor used class time effectively to enhance understanding of course topics.
11. Based on what I learned in this course, I feel well prepared to use the topics of the course in the future.
12. The instructor creates an inclusive learning environment for all students.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Ordinary Differential Equations 1 (Spring 2024)	4.75 ± 0.45	4.83 ± 0.39	5.00 ± 0.00	4.67 ± 0.65	4.92 ± 0.29	4.83 ± 0.39	4.42 ± 0.79	4.75 ± 0.45	4.67 ± 0.49	4.83 ± 0.39	4.50 ± 0.67	4.91 ± 0.30
Intro to Matrices and Linear Algebra (Fall 2023)	4.24 ± 0.83	4.55 ± 0.57	4.76 ± 0.44	4.65 ± 0.75	4.74 ± 0.45	4.67 ± 0.48	4.07 ± 1.16	4.52 ± 0.63	4.69 ± 0.47	4.48 ± 0.74	3.79 ± 0.98	4.72 ± 0.65
Linear Algebra (Spring 2023)	4.50 ± 0.53	4.75 ± 0.46	5.00 ± 0.00	4.88 ± 0.35	4.88 ± 0.35	4.88 ± 0.35	4.56 ± 0.53	4.44 ± 0.53	4.56 ± 0.53	4.56 ± 0.53	4.11 ± 0.60	5.00 ± 0.00
Analytic Geometry & Calc 1 (Fall 2022)	4.23 ± 0.94	4.66 ± 0.73	4.77 ± 0.70	4.76 ± 0.71	4.64 ± 0.77	4.47 ± 0.89	4.27 ± 0.89	4.26 ± 0.91	4.46 ± 0.75	4.39 ± 0.77	4.04 ± 0.87	4.72 ± 0.72
Differential Equations (Spring 2022)	4.26 ± 0.71	4.50 ± 0.66	4.84 ± 0.37	4.76 ± 0.44	4.79 ± 0.41	4.64 ± 0.55	4.33 ± 0.65	4.44 ± 0.66	4.56 ± 0.56	4.50 ± 0.62	3.94 ± 0.78	4.85 ± 0.36

Analytic Geometry & Calc 1 (Fall 2021)	4.34 ± 0.87	4.77 ± 0.43	4.97 ± 0.17	4.86 ± 0.36	4.86 ± 0.36	4.83 ± 0.38	4.29 ± 0.94	4.59 ± 0.66	4.79 ± 0.41	4.44 ± 0.93	4.21 ± 0.88	4.82 ± 0.46
Differential Equations (Spring 2021)*	4.77 ± 0.43	4.77 ± 0.43	4.91 ± 0.29	4.91 ± 0.29	4.95 ± 0.21	4.86 ± 0.35	4.55 ± 0.91	4.59 ± 0.59	4.77 ± 0.43	4.77 ± 0.43	4.50 ± 0.51	4.91 ± 0.29
Differential Equations (Fall 2020)*	3.84 ± 0.99	4.30 ± 0.94	4.84 ± 0.37	4.84 ± 0.37	4.87 ± 0.34	4.58 ± 0.76	3.97 ± 0.93	3.89 ± 1.07	4.51 ± 0.69	4.17 ± 0.94	3.54 ± 0.90	**
Average	4.37	4.64	4.89	4.79	4.83	4.72	4.31	4.44	4.65	4.45	4.08	4.85

*Courses were completely virtual due to COVID-19

**not included in original survey

Student Feedback as an Instructor

MATH 1270: Ordinary Differential Equations 1, Spring 2024

What did you like best about how the course was taught?

1. I loved the pace and the low pressure with exams having test corrections to help out. I was in this course for a few weeks last semester
2. and the pace was insanely fast that I couldn't keep up at all, this semester I actually felt like I had a chance to grasp everything during
3. class which was awesome.
4. I thought the lectures were easy to understand and exams were reasonable.
5. Dr. Welsh paced the content of the class very well and was always open to questions and clarifications. It was clear that they really
6. wanted us to understand the material and I think their teaching style of writing things out along with students was effective in that
7. endeavor.
8. The recordings were useful and took some pressure off of needing to attend in-person when traveling was kind of ridiculous.
9. Teaching through example problems was also extremely useful.
10. We always saw proofs for everything we did, not formal but derivations of all the formulas we used. Also, after each new concept, we
11. had at least one exercise/example, which was very useful when I was learning how to solve the homework exercises.

12. I think the homework was greatly helpful and not only this, but the content being taught in the course always had sections that would
13. explain certain questions I'd have while doing the homework. Dr. Welsh was very enthusiastic about teaching us all of the important
14. methods for computing differential equations and also included some examples of how they can be used in the real world.
15. posts lectures and notes, and prepares well for exams, and no final
16. Professor Welsh was very engaging and helpful, and i felt that she went through the course at a good pace allowing us to explore each
17. topic in depth. I also think the project made a lot of sense for this course, as it is a very application heavy subject.
18. This was the first class I have taken at Pitt that has felt accessible. I have ADHD which makes learning in math classes incredibly
19. difficult, but the way that this class is organized has allowed me to actually understand and even enjoy math. Dr. Welsh and Cameron
20. Watt are two of the best instructors I've had at Pitt and both care deeply about the subject they teach and the success of their
21. students.
22. I liked how engaging Dr. Welsh was both in an out of class.
23. I liked that the examples in class directly correlated with the homework. I also appreciated that notes were posted online along with
24. videos.

If you were teaching this course, what would you do differently?

1. Nothing
2. Nothing specifically!
3. I would probably take more breaks to make sure my students understand. I would also have practice exams, so my students get a good feel of the pace and difficulty of the exams. I would make the exams shorter and more challenging rather than long and lower difficulty.
4. I think it'd be good if the students felt more obligated to have good presentations! It seemed like for some reason, some of the groups weren't super motivated to do well on their presentation, which really confuses me because our group did take good time to thoroughly understand the task at hand.
5. Move slightly faster, and maybe a little bit more intense HomeWorks so students really have to think and spend time.
6. N/A

7. I might go over more diverse examples in class.
8. N/A

MATH 280: Intro to Matrices and Linear Algebra, Fall 2023

What did you like best about how the course was taught?

1. There was a lot of help available outside of class if needed.
2. Engaging lecture
3. I liked how there were questions we would try to do on our own before going over them. I also like how every lecture and homework was posted on canvas so I could look back at any of the content at any time. It made it very easy to study.
4. Most of the logic used was very intuitive and easy to follow because of the way it was explained.
5. Weekly HW going along with material
6. To be honest, nothing.
7. I like the professor used the textbook a lot and did everything in the same order, so it was easy to use the textbook as a resource. She always posted everything on canvas and the lectures were recorded, which made it very easy to catch up if you missed a class.
8. I liked how lecture notes and videos were uploaded to Canvas. I found them to be very helpful when I needed to refer back to a
9. section or if I had to miss class for that day.
10. I also liked how Dr. Welsh showed that she really cared about the well-being of her students. She was always very accomodating [*sic*] and not intimidating to reach out do. Her emphasis on maintaining good mental health is what makes her teaching some of the best I've ever been apart of.
11. The ability to view course material after lecture was very helpful.
12. I like that it was written out on an ipad and posted afterwards. Ipad teaching is so much better for the students in the class trying to see the board. You move through material very fast so it is helpful to be able to go back and fill in any gaps that I missed
13. Class Zoom recordings were helpful for later review
14. The mathematical derivations for concepts was excellent
15. I liked how all the material was made easily available to us – the notesheets, the homework answer keys, lecture recordings, and book sections really gave us all the resources we need to succeed in this class. I also liked how Dr. Welsh made adjustments i.e. fixing homework due dates, providing opportunities to earn back points and appreciated her understanding of students' situations.

16. Dr. Welsh was extremely accessible as well as thorough with course material which made harder concepts easier to understand. She also had their canvas set up in a way that was super organized and easy to navigate through. Additionally she made it possible to attend class over Zoom which helped when there were unforeseen conflicts with class time. She also uploaded the Zoom recordings of class as well as the notes so that they could be available for later reference. Furthermore, she gave us a lot of opportunity to make up lost points while also enforcing us to get a true understanding of lecture material. She was also just a very kind professor and very welcoming with any and all questions about the material!
17. I liked that lecture notes, which I think were organized well, were available on canvas. My handwriting is bad, so I don't like looking at my own, so it was helpful for me.
18. I really liked Dr. Welsh's notes format and how they were so kind and patient. I always knew that they were here to support me, especially since I frequently was in office hours or emailing. They were always ready to help in any way.
19. Dr. Welsh is always caring & understanding in and out of class, when dealing with both students' academic struggles as well as learning attitude. She is very nice and approachable so there was never any pressure seeking help in class or during office hours, which she also made flexible for almost every students.
20. She posted her lectures on canvas if you had to miss one.
21. I really like how Dr. Welsh made sure the class was inclusive for all students. She gave us the choice of attending lectures in-person or remotely over Zoom. She also gave us lots of material to look over to make sure we were well-prepared for exams and homework. I also like how she gave us 3 late passes to use when turning in homework, recognizing that everyone has busy or bad weeks and needs a little extra time to get things done sometimes. Dr. Welsh also taught the class in a very organized manner that was easy to follow along.
22. Dr. Welsh uploaded class notes and recorded the lectures, which were then uploaded to Canvas. These recordings were very helpful in reviewing information or catching up when needed to miss class while ill or overwhelmed with work. Along with this, Dr. Welsh provided many opportunities for extra credit, which was very appreciated, and all provided room to improve in not only the grade aspect, but also the learning aspect.
23. I really appreciated the flexibility. I didn't like attending class in person, as it was a bit crowded, so having Zoom and recorded lectures to review was incredibly helpful. I also thought the problems that she posted for us were very helpful, and she's very good at communicating clearly.
24. I think the way we have room to grow not just based on exams was very helpful. With homeworks and test corrections I feel as though I could still succeed even if an exam wasn't the best which I think is super important.
25. Amazing teacher, they really cared about each student and their success in the class.

If you were teaching this course, what would you do differently?

1. The lecture notes move incredibly fast. When writing, I wouldn't scroll down so far so quickly. Maybe just keep the text on the screen longer and start writing while still showing the previous notes. Also, lots of the questions on exams or hw are not the same as the examples we go over in class.
2. maybe go a little slower and do more a few more examples of harder-to-understand concepts
3. none
4. Nothing
5. More examples in class, much less derivation and definition!
6. I would do more examples, the course is an applied linear algebra class, not theoretical. I should not be writing an essay for "notes" in a math class.
7. i would try to give more reasoning for why are we doing what are we doing, and more visuals would have been better.
8. Maybe administer weekly 1–2 question mini quizzes about the main topic(s) for the week. This way, students will have an
9. understanding of what exam questions may look like and will hold them (including myself) accountable for not falling behind in class.
10. No departmental final. Or make the departmental final take home
11. Rely less on homework for exam prep because WebWork sucks
12. I would try to explain the content by explaining what each concept does spatially, rather than purely mathematically. I felt like I got what to do with the numbers, but to gain an intuition of how each concept played out in 2d or 3d space, I really had to go to other sources like Youtube and Khan Academy. Linear algebra is inherently a very spatial way to think about math, so I found it perplexing that large swaths of the course were taught with minimal explanations of the spatial aspects of a given concept [*sic*].
13. I think the timing of the exams and homework was a little odd – normally the homework due the Saturday of exam week was material covered on the exam, so without the answer key for that homework it made studying a little harder but it was still doable.
14. Maybe provide more practice problems
15. Maybe a few more practice problems if possible, but I know 50 minute classes are not a lot of time to do that.
16. More organized lectures & slight bit slower lecture pace.
17. I thought the exams were a bit too long and not much like the homework, especially the first one.
18. I would not do anything differently! Dr. Welsh did amazing at providing the material to the students.
19. The homework platform kind of sucks but that's not Dr. Welsh's fault.
20. I feel like the lectures had so many proofs and wording throughout that I got lost most of the time. I think if numerous concrete examples of problems were done first, then explaining what we did, would be a better order.

21. Honestly not in their power, but department exams.

MATH 1180: Linear Algebra, Spring 2023

What did you like best about how the course was taught?

1. I liked that we had a lot of opportunities to get points back. The class was very flexible while still being demanding.
2. I liked that the lectures and notes were available on the Canvas page. Also, the Canvas page was very well-organized. I felt that the
3. exams tested my knowledge well without being too difficult. I thought that Dr. Welsh was very fair and always willing to help you
4. succeed.
5. Lectures were flexible and could be accessed on canvas as well as lecture notes
6. The lecture notes allowed me to pay attention in class and take notes after class, they offered me flexibility in my schedule. I feel like
7. I learned a lot from this class.
8. Dr. Welsh was very engaging and taught the material in a concise manner.
9. I liked how there was a lot of structure in place in case we had to miss class, and the material was laid out in a good order to
10. progress between topics in a way that made sense
11. Dr. Welsh never assumed everything was obvious and did not make reviewing an old topic an annoyance. Dr. Welsh showed
12. enthusiasm and compassion and intelligence in a way that made learning more intuitive and interesting.
13. The homeworks are challenging enough and interesting.

If you were teaching this course, what would you do differently?

1. I would create small take home quizzes to reinforce big ideas needed for the tests. There was a lot of material that got very
2. overwhelming towards the end.
3. I would focus the homework problems more around practicing the concepts instead of proofs.
4. Nothing, it was amazing!
5. not really sure!
6. Nothing comes to mind
7. Instead of doing proofs and writing theorems down, I would assign those as homework reading or just doing the proofs for
8. homework, then focus on other harder things in class, like real world applications, harder problems, and so on. Writing down
9. proofs and theorems in class take unnecessary time. Also, just looking at the proof being done by someone else isn't very

10. memorable. Doing it ourselves would be a lot more effective.

MATH 220: Analytic Geometry & Calc 1, Fall 2022

What did you like best about how the course was taught?

1. I liked how she properly explained the topics and showed where each thing derived from before presenting us the material. Each lecture is also recorded allowing me the opportunity to go back and watch a lecture if I needed to.
2. I liked how we would take notes as well as do practice problems.
3. She taught as if I have never looked at calculus before and went step by step.
4. I like the many examples we do in class; it allows me to get a good and thorough understanding.
5. Dr. Welsh was always available and willing to help
6. Dr. Welsh was really helpful providing help inside and outside of the classroom. She was an extremely understanding teacher who graded fairly and really wanted to see her students succeed.
7. Dr. Welsh has a great understanding on how to best deliver course content.
8. I liked that she gave lots of examples during lecture.
9. I liked how open the environment felt, I felt comfortable to ask questions, or even reach out to my peers and ask them questions. I did not feel like I would be made fun of, if I asked a question that was easy to understand. Dr. Welsh was easy and accessible to get through too, and having a lab recitation in which I could ask any TA for help made this class so much better.
10. it was organized
11. I liked how the professor did examples in class
12. The lectures were really organized. I have taken calc before and my teacher taught it really messily with no clear organization so it made taking class notes very difficult, but in these lectures, because they are so organized, my notes are very organized so it is very easy to reference them when I study or need to look at it when doing homework.
13. I appreciated the layout of the course – the weekly homeworks and quizzes every other week helped me keep up with the course content and not fall behind.
14. the derivative
15. Very knowledgeable, easy to understand material
16. decent difficulty
17. I like that notes are saved
18. I thought the format of working out problems on the board was very helpful.

19. She is very helpful and understanding. She provides clear explanations and explains their work. She truly cares about the well-being of students.
20. I thought Dr. Welsh was very good at explaining things and good at answering questions in a way that makes sense to students learning calc for the first time.
21. I like that the notes were straight-forward and consisted of examples similar to those that would be on a test.
22. I personally like following along while the professor writes notes. There was a lot of extra practice, and the review links posted after the lectures on canvas were helpful. Also, you can tell that she wanted everybody to understand the material and do well.
23. I liked the organization of the class and the way in which the material was taught. I thought it was easily understood, and Dr. Welsh really explained the reasons why for everything.
24. Dr. Welsh always did extra for us, she provided extra reviews, took the time to answer questions well in class, etc.
25. I loved Dr. Welsh. She made it easy to learn, and the lectures were always recorded if you missed a lecture and needed to catch up. She was always available, and was very understanding and there to help. On exams, we were able to complete test corrections, which not only made my grade better, made it easier to understand what I did wrong and how to fix it/do it right next time. Probably one of my favorite professors.
26. I liked how people weren't afraid to ask questions and Dr. Welsh would always answer whatever questions people had
27. I truly enjoyed the format of notes in lecture. I appreciated Dr. Welsh's efforts to post prior notes before class, record lectures, and allow students to zoom into the class. Giving extensions allowed us to work at problems for longer, rather than rush and guess answers just to turn in the Lon capa assignment.
28. I truly enjoyed the format of notes in lecture. I appreciated Dr. Welsh's efforts to post prior notes before class, record lectures, and allow students to zoom into the class. Giving extensions allowed us to work at problems for longer, rather than rush and guess answers just to turn in the Lon capa assignment.
29. The flow of the class material was very efficient for students as most topics flowed into the next topic.
30. I liked that she was very lenient about when homework was due and gave us problems on the homework that were comparable with problems we did in class
31. I liked the fact that Dr. Welsh tried to make sure everyone understood the material before moving on every single lecture.
32. Lectures, notes, textbook problems, resources all posted on Canvas; Exams more focused on learning and understanding content than memorizing and perfection; opportunities to learn from mistakes
33. The abundance of example problems was helpful
34. Everything was very easy and accessible to find on canvas. Lectures were good
35. Abstract or hard math concepts were associated with real life problems, making everything easier to understand.

36. I really liked the style of the lecture. I felt as though the flow of material made sense and all of the examples provided were very helpful. I also really liked how available the material was after lecture. I had to miss a couple of classes for personal reasons and I found it really easy to make up the material.

MATH 290: Differential Equations, Spring 2022

What did you like best about how the course was taught?

1. Usually problems can be related to the real world. It makes the class more engaging.
2. The content was present in a very organized manner. All lecture notes and content from previous semesters and the lecture recordings were always posted in a timely manner. If mistakes were made, they were corrected and owned. A lot of power was given to the students to communicate and get feedback.
3. I liked the friendly atmosphere that Dr. Welsh created in the classroom. She is very reassuring and didn't stress me out, even though the course material was challenging.
4. I really liked that I was able to watch the recorded lectures. It was how most of my learning was done and I wish all of my classes would record lectures since I have a hard time keeping up during in person classes.
5. Concepts were taught while giving lots of examples, which helped me conceptualize what we were talking about. Also, when we didn't need to know why some things were the way they were, we didn't waste time talking about it.
6. Giving examples for real life cases when applicable
7. I thought Dr. Welsh was very organized in the way she taught the information.
8. I liked the adaptability to different peoples schedules and walks of life. The teacher was also very understanding when dealing with issues.
9. I liked the general structure of the class, lectures with homework due every week. I also liked the practice she would provide before exams
10. Topics are explained very thoroughly and the examples done in class were very helpful.
11. Being able to learn from your mistakes on the exams through test corrections
12. I liked how she really wanted us to do our best and she made sure she gave us the opportunities to do so.
13. I liked how this course's homework was done on paper rather than a computer program like Lon Capa
14. The course was taught in a simple way that allowed me to understand difficult topics. Dr. Welsh is extremely available and gets back to emails incredibly quickly. She is devoted to allowing all students to understand the course material.
15. Dr. Welsh did a fantastic job teaching this course in an understandable and easy to digest way. It is evident that her main goal is to ensure that students understand the material. Whether it be through test corrections or homework extensions, Dr. Welsh

does everyone she can to make sure that every student has ample opportunity to digest the content and seek help when needed. Her unending understanding and compassion shows through her teaching, and I was very impressed by her professionalism and quality of teaching after so little experience in front of a classroom relative to other professors.

16. I liked that the lectures were available in person and on zoom. I also found office hours very helpful.
17. I liked how Dr. Welsh was available for office hours and help outside of class. She is extremely approachable and very kind. I also like how we can do test corrections because this took a little bit of my test anxiety away.
18. I thought Dr. Welsh was a great professor in that she was extremely fair. I appreciated having test corrections and being told the topics of the exam before the exam. I felt that the lectures had a good balance of example problems and content.
19. I enjoyed how she prioritized our learning over grades.
20. I thought expectations for HW, quizzes, and exams were very clearly set. I liked that there were lots of ways to help our grade.
21. The class in general has a lot of very cool applications and they were explained well by Dr. Welsh.
22. I like the straightforward lectures with examples.
23. Literally anything I don't mention below was incredibly well taught, and I liked her approach of teaching concepts, then general answers, then specific examples.
24. I also benefitted strongly from office hours, and left feeling more confident and comfortable [*sic*] with the material I asked questions on.
25. I appreciated the incorporation of virtual class at all times even though it was not required by the University. It made my daily schedule more bearable knowing that I was able to join from my laptop.
26. I liked that all class notes were posted to Canvas. That made me feel a lot better about taking notes in-class, because I always knew I could double check later if I was confused about how to do something.
27. The fact that the instructor very much stayed with us while teaching and understood how we learn. It's nice to be asked frequently if we understand the material when it is rough to learn. Dr. Welsh paid attention to the needs of her students and was capable of explaining the topics at a different level for us to better understand it.
28. I loved the extra material given outside of class that is perfect for understanding the material thoroughly.
29. I liked the flexibility and extra credit opportunities available to students.
30. I liked how the lectures were formatted and it was easy to look back at lecture notes if I needed to.
31. did appropriate examples

MATH 220: Analytic Geometry & Calc 1, Fall 2021

What did you like best about how the course was taught?

1. Plenty of example problems for each new topic.

2. The professor was incredibly kind and willing to help. Office hours were additionally very helpful.
3. The Professor really cared and was very flexible to accommodate for students rather than being a very rigid structure.
4. I really liked that she gave us the option to attend class in-person or online. Especially on days where I had a ton going on at night, this was really helpful to me. The fact that she also posted the notes and recorded lectures was also really nice. Finally, the optional class attendance was nice because it really made sure I kept myself accountable in regard to staying up to date and attending class.
5. I think she is the best math instructor I have ever had. Everything she said was clear and straightforward. She was well prepared and knew the material she presented backward and forward. She answered questions gladly.
6. Very descriptive
7. How available for help she was.
8. I liked how open my professor was to me and how she always offered help when needed.
9. I liked how we could follow along with the notes in class and they were available to us after class as well. I like how everything in lecture went along with what we had to do in our homework.
10. I liked how the professor went over a lot of different example problems in class and posted the work online; it was easy to go back to to *[sic]* review problems.
11. I like how the course was flexible and didn't need to follow a rigid schedule.
12. It taught me that I am capable of learning things I assumed were impossible. I always struggled greatly with math in high school, and I knew college level calculus was going to be intense. It was for me, but I got through it. I am more than satisfied with my experience.
13. I liked how Dr. Welsh would write down almost everything she said during class, so when I would look back at my notes I could follow them like I was in class.
14. The teacher's attitude.
15. I liked that her lecture notes were available after the class online.
16. How it was both online and in-person but mostly focused on in-person
17. I liked how Professor Welsh gave many examples in class that were similar to those that were on the quizzes and exams. This made is very easy to prepare for exams and definitely helped with my success in the class.
18. I liked the ability to attend via zoom or in-person because it is a night class. She also gave us access to zoom recordings and lecture notes which was really helpful for the information that was sometimes missed. I like the detailed examples explained in class.
19. I liked how organized it was.
20. The lectures were posted later to canvas so I could look back on them when I needed help.

21. The professor was very approachable and very understanding. She also was excellent at explaining topics plainly in order for students to gain a thorough understanding. I really enjoyed this class because of her, which is something I was not expecting from a math class. She was also very receptive to any issues or concerns the students had. In addition, she was very flexible/adaptable to the needs of her class and would make sure to accommodate them as best as she could. I very much appreciated it.
22. The lectures were very informative and I liked the availability of online recordings of the lectures, something that greatly helped me study.
23. In-depth explanations in notes
24. There were multiple examples provided in class as well as in the homework which made it very clear what we would be tested on. Additionally, the lectures being recorded allowed me to go slowly through them while pausing and playing to fully learn everything. Additionally, Dr. Welsh was always available and offering help outside of class for students. Although calculus is a very difficult subject, I think Dr. Welsh made it very manageable for her students by giving them work that would benefit them and as long as the student completed it they would succeed.
25. Dr. Welsh was very understanding and her teaching methods were easy to follow
26. I liked the examples provided by the teacher in lecture because they helped me with the homework and to study for exams.
27. I like how we learned everything slowly but and was explained thoroughly.
28. I loved Dr. Welsh so much! She taught the class in a way that I was never too intimidated to answer questions, even when I thought I could be wrong. She projected her notes on an iPad which was nice for when I was sick and all of her notes were available to me. She also was a fair grader who gave great feedback.
29. Dr. Welsh was very instructive and knew the material well. She often gave opportunities to help increase your grade through extra credit/exam corrections which were substantially helpful.
30. I liked the intensity of this course, it was very difficult and a challenge for someone like myself, who has a history in struggling in math. Dr. Welsh did a great job with helping me and other students who struggled with the actual math but understood the concepts of calculus through office hours, recitations and leisure points on tests via corrections.
31. I liked the asynchronous option of this course being in-person and online. I also liked that Dr. Welsh provided a lot of examples for every topic we learned.
32. I liked how she had example problems for each concept.

MATH 290: Differential Equations, Spring 2021

What did you like best about how the course was taught?

1. I liked how the professor took notes with us simultaneously, that is how

2. I learn best.
3. I love the connections between differential equations and real-world systems. I have always enjoyed math, but I also struggled to match what I learned in class with phenomena that I see in the world. This class was fantastic at discovering the relationship between mathematical models and real-world systems. As an engineering student I loved seeing things like the application of second-order diff eqs in oscillating systems like a bridge.
4. lots of examples and the things taught were actually on exams
5. The professor is always prepared, her notes are extremely easy to follow, deadlines are realistic, and the midterm format was extremely accommodating
6. I liked that the professor gave us a lot of resources for topics like linear algebra, trig, or geometry that she didn't need to give us, but she did so that we would have all the tools to solve the problems. I also liked that we solved problems together instead of watching a slide solve the problem.
7. I really liked the pacing and notes that were used during lecture. They were well organized and easy to go back to and understand.
8. Dr. Welsh made the class feel relaxed and not too stressful. She also gave very good explanations for all the topics.
9. I like how Dr. Welsh went through many examples thoroughly, which is how I learn best.
10. I really enjoyed Dr. Welsh's teaching style. I think everything was taught clearly, and she was very patient and understanding.
11. I like how matlab and applications were taught.
12. Dr. Welsh sets up the class very nicely and never expects us to dedicate all of our time just to her class. She also gave very thorough notes and had lots of extra videos and resources available to us. The pace the material was studied was very good as well!
13. The professor was very good at making sure everyone was understanding of the material, giving good examples and working through the harder content so that everyone understood.
14. There was a ton of flexibility in terms of grading and weighting, and I really liked that we were explicitly told what we needed to know and what to practice so that we could succeed. It reduced so much stress knowing that the course policies were there to help me succeed and not just keep me in line.
15. I thought the material was presented clearly and at an acceptable pace.
16. I really liked the instructor, the way that lecture notes were presented, the format of the tests, and the leniency given for deadlines. It was a very positive environment
17. Homework problems were extremely useful
18. great

What did you like best about how the course was taught?

1. The lectures were recorded and easy to follow
2. The three late homework passes are an amazing idea. It was so helpful when I was feeling stressed about completing a homework on time, to know that instead of giving up I could take another week to work through it and turn it in. I would recommend every professor do this.
3. Dr. Welsh was exceptionally available. I emailed her past midnight one night and she responded within a minute with a well-worded, concise, clear explanation. I cannot stress how useful it was to have her be so available to answer my questions. It made learning differential equations so much easier.
4. The course proceeded in a very logical way.
5. I liked how the HW was appropriate in that it did a good job with helping us understand the concepts. It helped prepare us for exams and did not seem like busy work given by other classes.
6. I liked that lecture was recorded and that all notes were posted on canvas.
7. I liked that the homework assignments correlated to the previous week's material. This made sure we really understood the material before doing the homework. [*sic*]
8. I liked that there was a slack for students to communicate with each other and the teacher about different homework solutions.
9. I liked that many in-class examples were given.
10. The practice questions/examples were the most helpful.
11. The course offered a lot of flexibility and Dr. Welsh was super understanding throughout (thank you!).
12. exams were open for 48 hours
13. dr welsh was very nice
14. I liked that Dr. Welsh was available to us.
15. I liked that the tests were take-home to give us a bit more time to work on them.
16. I like the project idea
17. I enjoyed going to office hours and being able to talk about both diffeq and life.
18. I felt that Professor Welsh was very accessible outside of class time and was always willing to help.
19. I liked how available and willing the teacher was to meet.
20. Dr. Welsh was very thorough and provided good examples during lecture.
21. Clear and reasonable progression.

22. I thought the amount of work was reasonable. There were a good number of examples taught in class to help understand the material. I thought the Slack page was helpful.
23. Dr. Welsh was very helpful and broke things down very well so we understood them well. Loved this class!
24. I liked how the professor went through step-by-step for each question in lecture. Also, I liked material taught related directly to homework, extra practice questions, and exam questions – it did not feel like a shock and greatly enhanced my understanding of differential equations.
25. She was very sweet and broke it down a lot
26. I liked how engaged Dr. Welsh is when teaching the class and makes a fun learning environment
27. slack interaction
28. personable professor
29. She was very easy to reach outside of class
30. The professor is very available. I absolutely love this course despite the fact that it is very challenging.
31. i could rewatch videos
32. I really liked how lenient Dr. Welsh was. Very very kind. I just hope at this point I pass the final. I also like how if you had to, you could get an extension, no questions asked. she was very understanding of the odd circumstances we found ourselves in this semester. also I liked how you made the midterms like the final because lets be honest, the final is the only thing that matters in this class as it basically determines your final grade [*sic*] (absolute BS but I understand that that is not your choice :(
33. I like that Professor Welsh cared about her students. She made sure there was multiple different ways to learn the material and watch the lectures. She made sure attending asynchronously was just as fair and affective as going to the live lecture over zoom. Her class was fair in every aspect, and she made herself available to her students at all times.

Teaching Assistant at Georgia Institute of Technology, School of Physics

Course Descriptions and Topics

PHYS 2211: Intro Physics I

Description: A calculus-based course with a laboratory covering classical mechanics, applications of classical mechanics, oscillations, and waves.

Topics: Kinematics equations, energy, waves, inertia, forces, momentum

Duties: Understood how laboratory setups worked and how to provide simple trouble shooting, reviewed basics of physics topic needed for lab, facilitated lab sections, graded lab reports, graded and proctored midterm exams and finals

Notes: N/A

PHYS 3266 Computational Physics

Description: Computer solutions of realistic physics problems such as projectiles in resistive media, electromagnetic sources and fields, atomic scattering, and band pass filters.

Topics: Intro to python, intro to java, integration methods, computational error, Arduino assembly, Arduino programming,

Duties: Write homework solution, grade solutions, hold office hours, grade projects, grade exams.

Notes: While TAing this course, I was also in Georgia Tech's Tech to Teaching program where I additionally helped prepare the syllabus, prepared lectures, taught lectures, was observed on lectures, and more. Additionally, as my PhD advisor taught this course regularly, I had taught additional lectures years that I was not a TA.

Courses Taught, Number of Students, Response Rate

- PHYS 3266 Computational Physics, Spring 2015, 24 students, 58% response
- PHYS 2211 Intro Physics I Section C03, Spring 2013, 47 students, 12% response
- PHYS 2211 Intro Physics I Section C04, Spring 2013, 47 students, 19% response
- PHYS 2211 Intro Physics I Section A04, Fall 2012, 42, 14% response
- PHYS 2211 Intro Physics I Section A05, Fall 2012, 42, 14% response
- PHYS 2211 Intro Physics I Section A06, Fall 2012, 42, 12% response

Survey Questions and Scores

1-5 Likert Scale with 1 being Strongly Disagree and 5 being Strongly Agree

	Overall	Oral Comm.	Written Comm.	Explained concepts clearly	Concept familiarity	Respect for students	Attitude about teaching	Stimulated interest	Approach ability	Preparedness	Classroom management	Engaged Students
Computational Physics (Spring 2015)	4.9	4.7	4.8	4.6	4.8	4.9	4.7	4.6	4.9	4.6	4.8	4.8
PHYS 2211 Intro Phys I C03 (Spring 2013)	5	5	4.9	4.9	5	5	4.9	4.4	5	5	4.9	4.9
PHYS 2211 Intro Phys I C04 (Spring 2013)	4.6	4.6	4.4	4.6	4.8	4.9	4.8	3.6	4.9	4.9	4.8	4.5
PHYS 2211 Intro Phys I A04 (Fall 2012)	5	4.9	5	4.9	5	4.9	4.9	4.9	4.9	5	5	5
PHYS 2211 Intro Phys I A05 (Fall 2012)	5	5	5	5	5	5	4.9	5	5	5	5	5
PHYS 2211 Intro Phys I A06 (Fall 2012)	4.7	4.9	4.8	4.9	4.9	5	5	4.5	4.7	4.9	4.7	4.3
Average	4.87	4.85	4.82	4.82	4.92	4.95	4.87	4.50	4.90	4.90	4.87	4.75

Student Comments and Feedback:

PHYS 3266, Computational Physics Spring 2015

1. She could really explain concepts well, and find problems, as well as more clearly explain concepts taught by the professor.
2. You were a good TA, did well teaching.
3. Communication with the students
4. The TA was very approachable and helpful during office hours.
5. The TA had a strong grasp of dynamical systems which fit in nicely with the course.

6. She tried to come up with activities that would teach us valuable coding skills in a class period. Ultimately the experience failed, but overall it was a nice idea
7. She had great enthusiasm

PHYS 2211, Intro Physics C03 Spring 2013

1. Communication and help with difficulties in lab.
2. She was really great at caring about the students understanding what they were supposed to be doing. Every week, the entire lab period she would constantly be with a group helping anyone who had a problem.
3. Explaining the material.
4. She made all of our labs very easy to understand and offered a great amount of assistance. She always tried her best to provide help to as many people as possible, as fast as possible.
5. She was very nice and helpful; always ready to lend a helping hand. She had great explanations of the lab prior to the class and always made it clear what we needed to do.
6. She was very helpful, and answered questions great during the lab.
7. She was very helpful if you ever got stuck during lab. When some TAs would have gotten annoyed with questions, Andrea was eager to help and make things run smoothly.

PHYS 2211, Intro Physics C04 Spring 2014

1. Andrea communicated well with the students. She had no trouble explaining the lab and answering our questions when we needed help.
2. Her friendliness and easiness to approach when in need of help.
3. Very kind, knew her way around the lab
4. Communication and helpfulness.
5. Andrea was very good at helping me figure out the concepts rather than flat out telling me the answers. She really made sure that we understood what the labs were supposed to be teaching us, even if the data wasn't good.
6. Made lab easier and was ready to answer any questions we may have had.
7. Very Helpful

Teaching Assistant at University of Texas – Austin, Department of Mathematics

Course Descriptions and Topics

M408L: Integral Calculus, Fall 2011

Courses Taught, Number of Students, Response Rate

M408L: Integral Calculus, X, X

Survey Questions and Scores

Student Comments and Feedback

M408L: Integral Calculus, Fall 2011

Private Tutoring Profile and Feedback

Tutoring reviews (<https://www.wyzant.com/match/tutor/78724410>):

Excellent Tutor I Highly Recommend

Andrea has tutored me in my second semester of Calculus and she is such a great help. She is very patient and brilliant, being able to think of the problems very quickly. We go back over lessons that I was taught in class, do practice problems, and she answers my detailed questions from my work outside of class. She also has been available for me to email her anytime with a question on homework or reviews. She puts subjects that are difficult in simple terms for me and has given me great advice on how to check my work on tests. She is very easy to contact and has flexible hours to meet up with. I highly recommend her.- Charles, 11 lessons with Andrea

First test success

After two sessions our daughter's study habits have improved and she got a great score on her first test for the he semester. Definitely time well spent. Thanks, Andrea!- Kevin, 7 lessons with Andrea

Knowledgeable and patient tutor

Andrea worked on Physics concepts and problems. She explained ideas well and was patient. Andrea listened carefully and knew exactly what my kids needed to figure out.- Monica, 4 lessons with Andrea

My kids think she is great!

My kids are learning a lot from Andrea. Both my 16 year old son and my 16 year old daughter think that she is an excellent tutor. Andrea is prompt, patient, and flexible in scheduling. Five stars!- Sherry, 16 lessons with Andrea

Great tutor!

Andrea is a really helpful tutor who is flexible to work with. She seems to have a very strong knowledge of the subject and incorporates practice problems to help with understanding. She is also very pleasant to work with!- Reed, 3 lessons with Andrea