# Spring 2023 Engineering Instructor Report for SP2023.E81.CSE.468T.01 - Introduction to Quantum Computing (Ron Cytron)

Project Title: **Spring 2023 Course Evaluations - Danforth Campus**

Courses Audience: **108**
Responses Received: **102**
Response Ratio: **94.44%**

**Report Comments**

Welcome to your Instructor Report for WashU Course Evaluations. Below you will find response data from the specified course section. Responses to personalized questions appear at the bottom of the report.

The intention of this report is to provide feedback, and also to prompt improvement in areas that may be lacking. This report is accessible to appropriate department level and school level users, as determined by your school. We appreciate your dedication to our learning community at Washington University.

If you have questions about this report, please contact evals@wustl.edu

Creation Date: **Wednesday, May 17, 2023**

## Course Administration

### Was a course syllabus or a course information sheet distributed or available online?

| Was a course syllabus or a course information sheet distributed or available online? | | |
|---|---|---|
| Options | Count | Percentage |
| Yes | 98 | 100.00% |
| No | 0 | 0.00% |

### Did the syllabus explain the content and administration of the course (e.g., office hours, grading)?

| Did the syllabus explain the content and administration of the course (e.g., office hours, grading)? | | |
|---|---|---|
| Options | Count | Percentage |
| Yes | 94 | 96.91% |
| No | 3 | 3.09% |

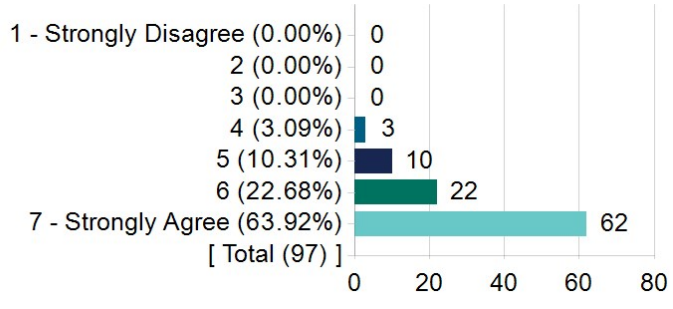
### Early in the semester, did your professor explain the expectations for academic integrity?

| Early in the semester, did your professor explain the expectations for academic integrity? | | |
|---|---|---|
| Options | Count | Percentage |
| Yes | 97 | 100.00% |
| No | 0 | 0.00% |

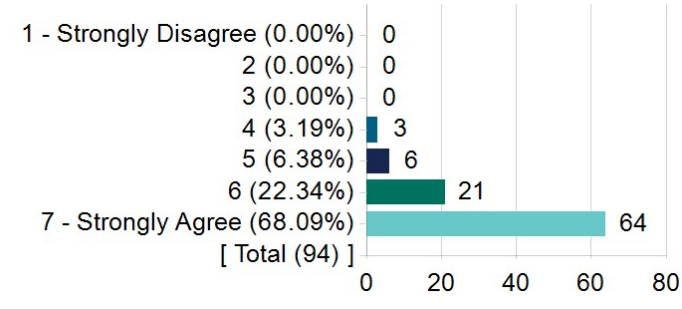
### Rating Scale Responses

| Question | Subject | | | |
|---|---|---|---|---|
| | Response Count | Mean | Standard Deviation | Median |
| In retrospect, the syllabus was an accurate reflection of how the course was actually taught. | 97 | 6.47 | 0.80 | 7.00 |
| The course matched the course catalog description. | 94 | 6.55 | 0.76 | 7.00 |

1. In retrospect, the syllabus was an accurate reflection of how the course was actually taught.




2. The course matched the course catalog description.



1. In retrospect, the syllabus was an accurate reflection of how the course was actually taught.


2. The course matched the course catalog description.


**Please elaborate if you felt the course did not match the course catalog description.**

| Comments |
|---|
| N/A |
| it made it seem a bit harder |
| no |

**Please rate how well Ron Cytron promoted an inclusive learning environment with regard to the diversity of student personal backgrounds and identities.**

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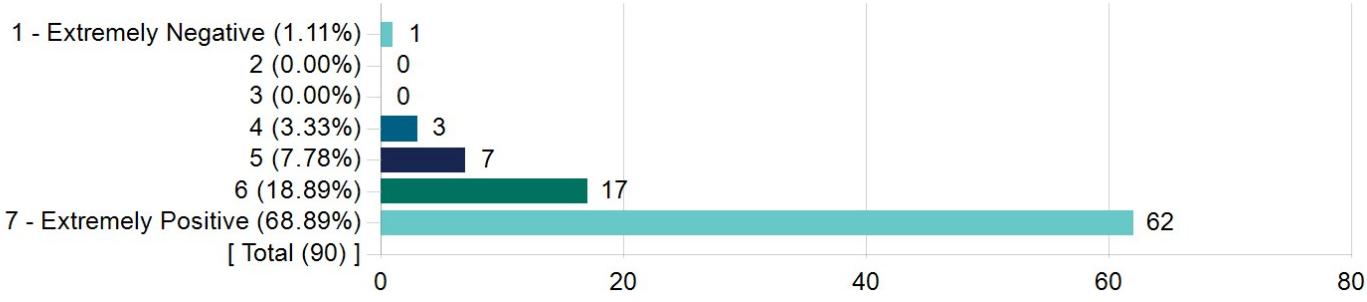


| Statistics | Value |
|---|---|
| Response Count | 90 |
| Mean | 6.49 |
| Median | 7.00 |
| Standard Deviation | 0.97 |


**Where relevant, please give specific examples to explain your answer above.**

| Comments |
|---|
| Although the slides were very thorough they could be difficult to navigate due to the size of each presentation. Overall I thought the concepts were interesting and well–taught |
| Very accessible in office hours. |
| N/A |
| He is SOOOOO patient with everyone and always treats everyone the same, even when they are rude or not the most intelligent. |
| He was always very welcoming in OH and didn't hesitate to explain confusing topics until you understood them. |
| Prof Cytron is nice and patient to answer question from different diversity of student |

## Instructor Evaluation

**Overall rating for teaching quality of Ron Cytron.**

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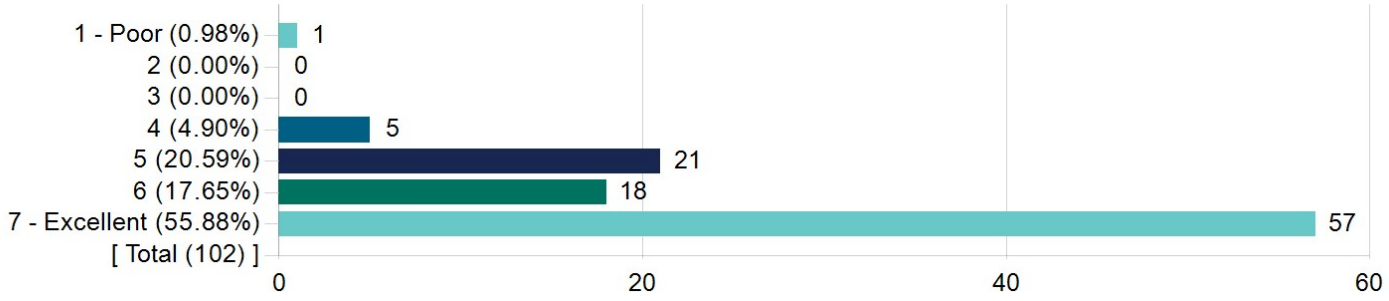
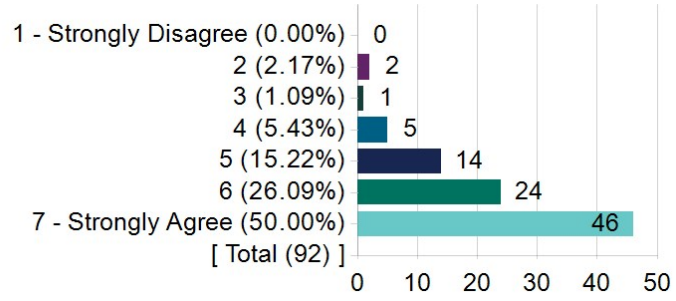



| Statistics | Value |
|---|---|
| Response Count | 102 |
| Mean | 6.21 |
| Median | 7.00 |
| Standard Deviation | 1.08 |

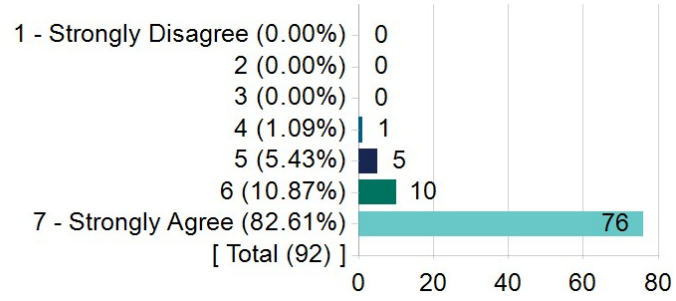
## Rating Scale Responses for Ron Cytron

| Question | Subject | | | |
|---|---|---|---|---|
| | Response Count | Mean | Standard Deviation | Median |
| The instructor made the course interesting. | 92 | 6.12 | 1.15 | 6.50 |
| The instructor was enthusiastic about the course. | 92 | 6.75 | 0.60 | 7.00 |
| The material was covered at a reasonable pace. | 92 | 6.05 | 1.30 | 7.00 |
| The instructor was available to answer questions (through office hours, email, etc.). | 92 | 6.53 | 0.86 | 7.00 |
| The instructor was well-organized and prepared for class. | 92 | 6.50 | 0.90 | 7.00 |
| The instructor explained the course material so that you could understand it. | 92 | 5.79 | 1.48 | 6.00 |

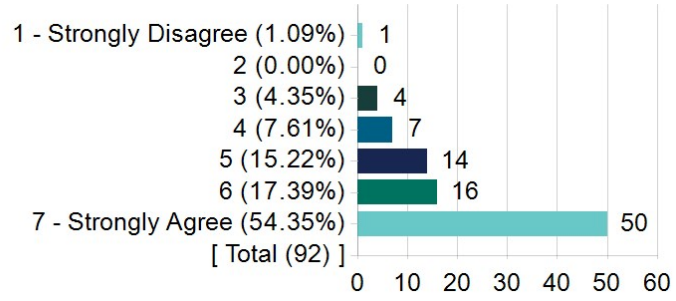
### 1. The instructor made the course interesting.



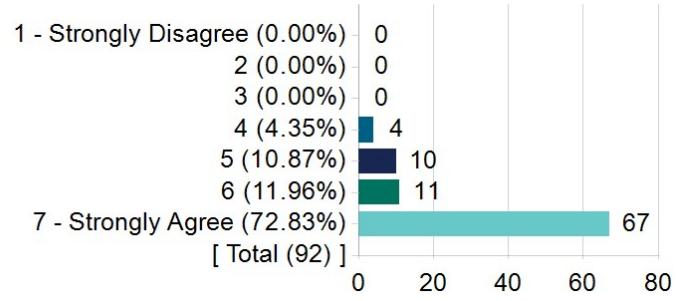

### 2. The instructor was enthusiastic about the course.



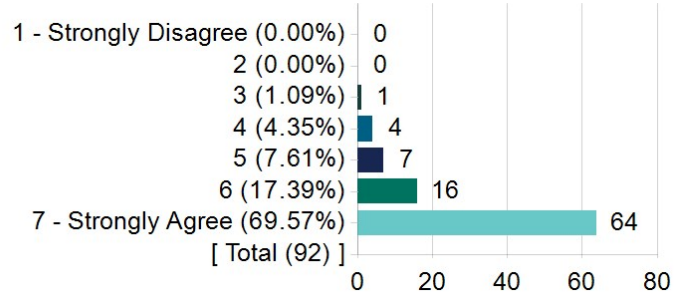

### 3. The material was covered at a reasonable pace.



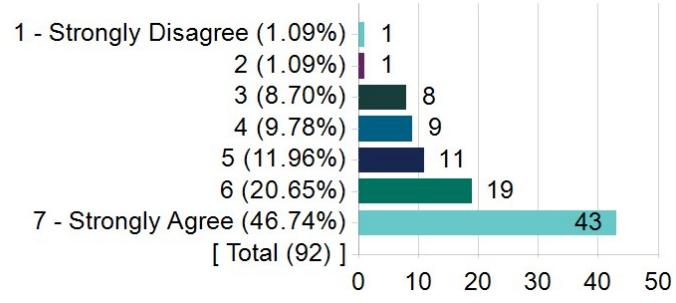

### 4. The instructor was available to answer questions (through office hours, email, etc.).




### 5. The instructor was well-organized and prepared for class.

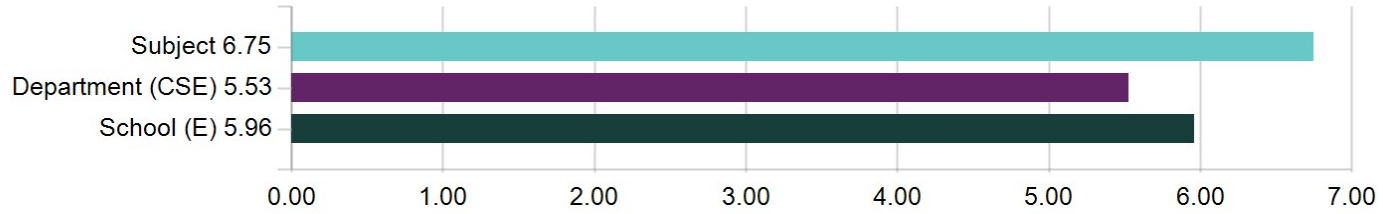



### 6. The instructor explained the course material so that you could understand it.

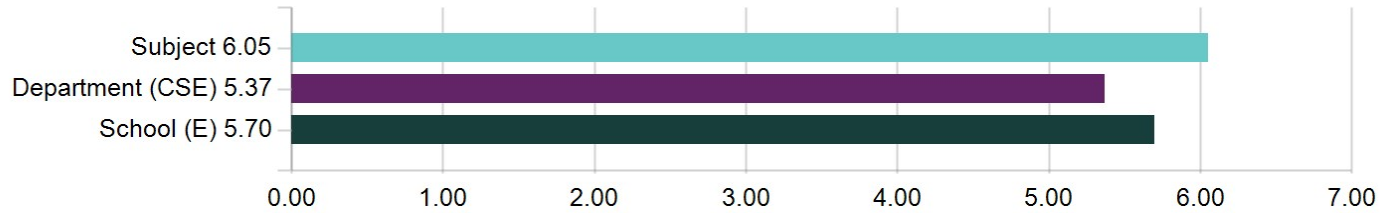


1. The instructor made the course interesting.

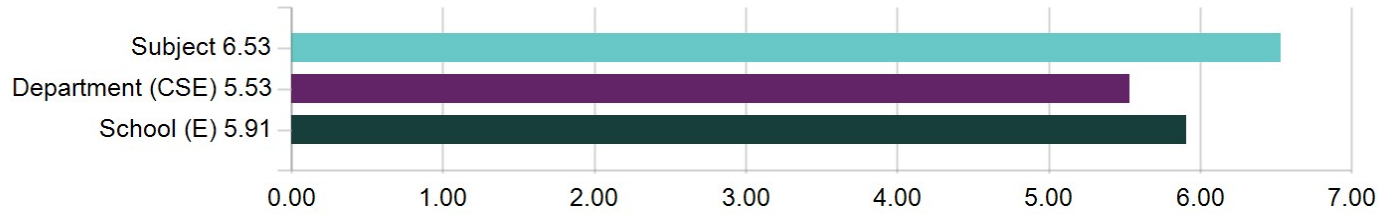

2. The instructor was enthusiastic about the course.



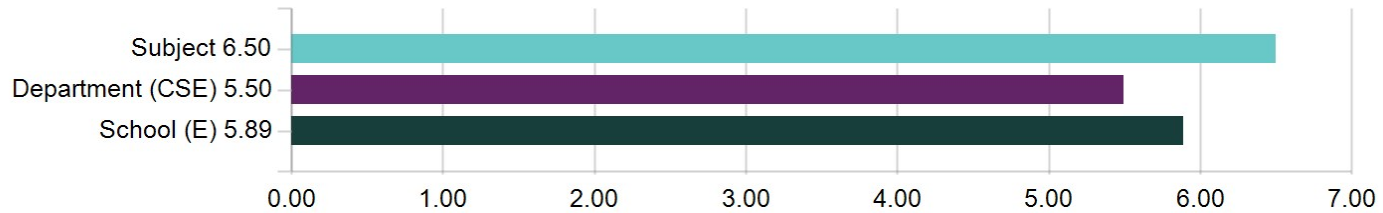

3. The material was covered at a reasonable pace.




4. The instructor was available to answer questions (through office hours, email, etc.).




5. The instructor was well-organized and prepared for class.




6. The instructor explained the course material so that you could understand it.

### Please elaborate if you felt the material was not covered at a reasonable pace.

| Comments |
|---|
| Reasonable pace but the slides were very confusing and the way they were laid out made it hard to follow. Even though each deck was like 20–30 slides it ended up being ~200 with the way they were presented which just made for harder studying. |
| I think the beginning went a little fast and the end went a little slow. Less time on proofs, more time on dirac notation |
| N/A |
| It was mostly good, though the end of the course happened very quickly with a lot of information that made it hard to grasp everything for me personally |
| I think the material in the beginning could have been covered a bit quicker and then more time could be spent on the later more difficult concepts. |
| I really need recordings. There are no recordings |
| I was lost for a good bit there and never caught back up, granted I could have put more effort. Got backed up with classes |
| The course content is hard to understand thoroughly |
| two assignments due every week in the worst part of the semester |
| The material is definitely challenging but it was taught well |
| I felt that the class moved a little too slow. We could have probably covered a lot more fun stuff if we did not spend as much time solving basic linear algebra during class time. |

## Course Materials and Assignments

### Overall rating of course content.

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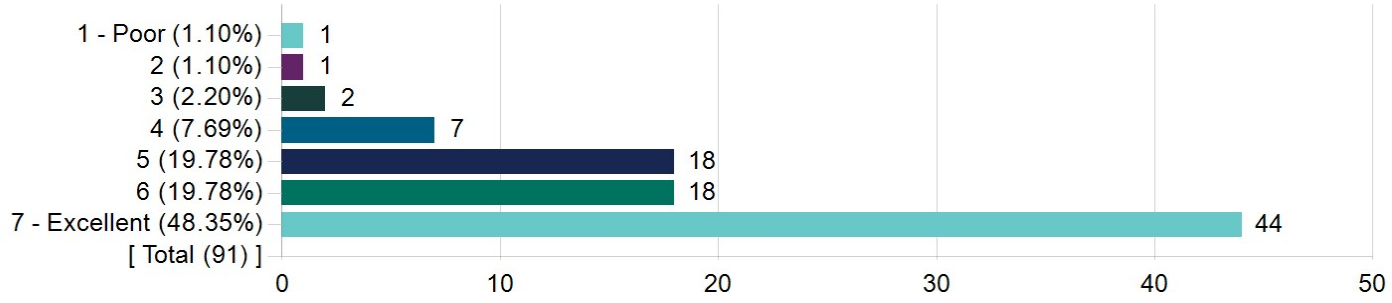
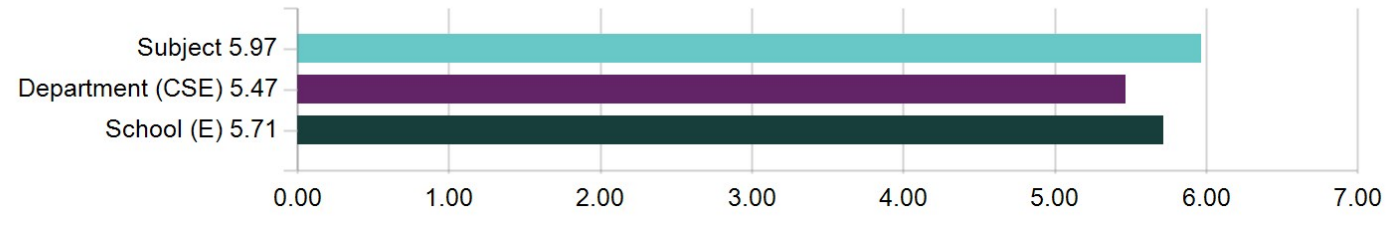


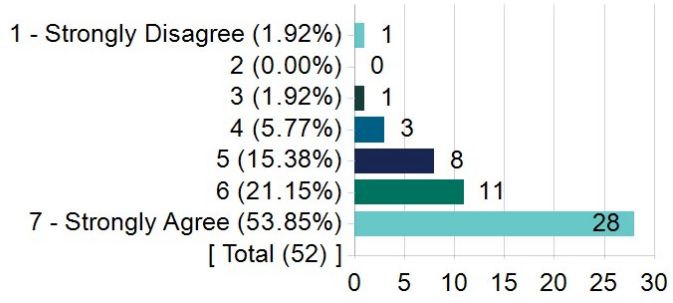

| Statistics | Value |
|---|---|
| Response Count | 91 |
| Mean | 5.97 |
| Median | 6.00 |
| Standard Deviation | 1.29 |



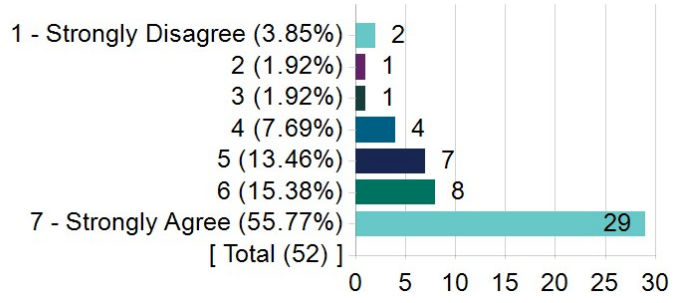
## Rating Scale Responses

| Question | Subject | | | |
|---|---|---|---|---|
| | Response Count | Mean | Standard Deviation | Median |
| Textbooks/readings complemented the lectures. | 52 | 6.12 | 1.26 | 7.00 |
| Textbooks/readings were useful. | 52 | 5.94 | 1.58 | 7.00 |
| Assigned homeworks were helpful and relevant to the course. | 90 | 6.31 | 1.09 | 7.00 |
| There was reasonable time to complete assignments. | 90 | 6.06 | 1.38 | 7.00 |
| Assignments were returned within a reasonable period of time. | 90 | 6.50 | 0.84 | 7.00 |
| Comments on graded work were helpful. | 84 | 5.70 | 1.50 | 6.00 |
| Labs were an effective supplement to the course. | 58 | 6.21 | 1.32 | 7.00 |
| The course material drew upon real world applications. | 87 | 6.06 | 1.31 | 6.00 |

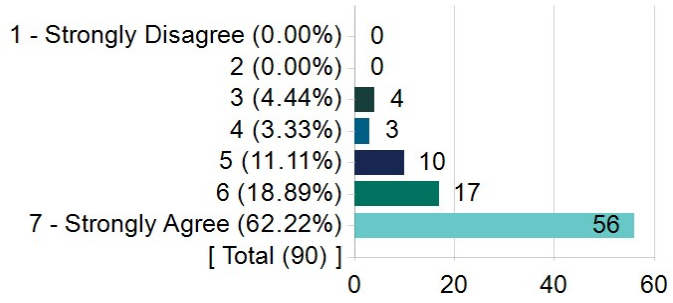
## 1. Textbooks/readings complemented the lectures.



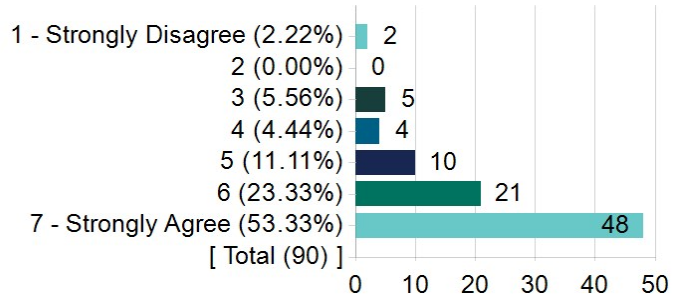

## 2. Textbooks/readings were useful.



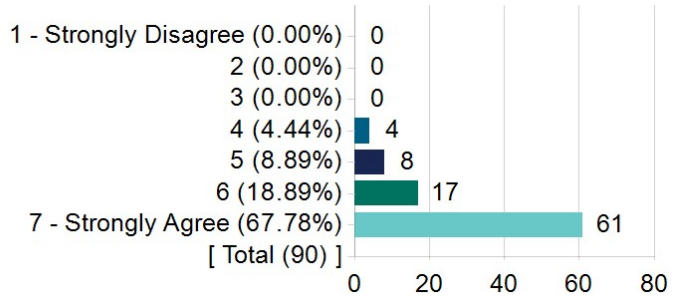

## 3. Assigned homeworks were helpful and relevant to the course.



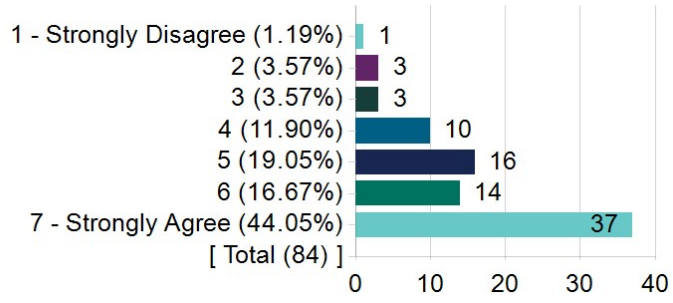

## 4. There was reasonable time to complete assignments.



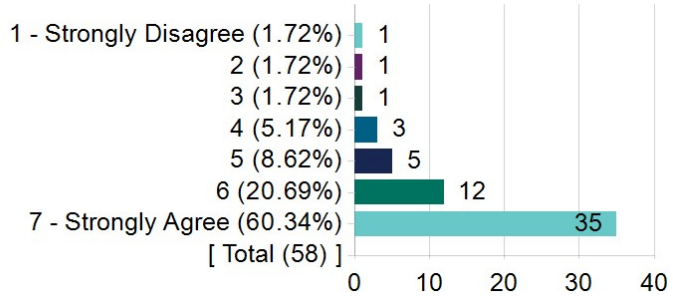

## 5. Assignments were returned within a reasonable period of time.



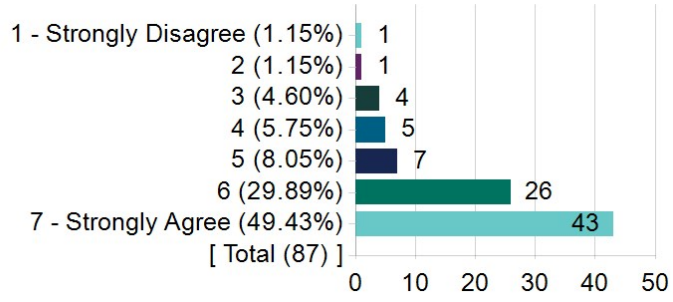

## 6. Comments on graded work were helpful.




## 7. Labs were an effective supplement to the course.

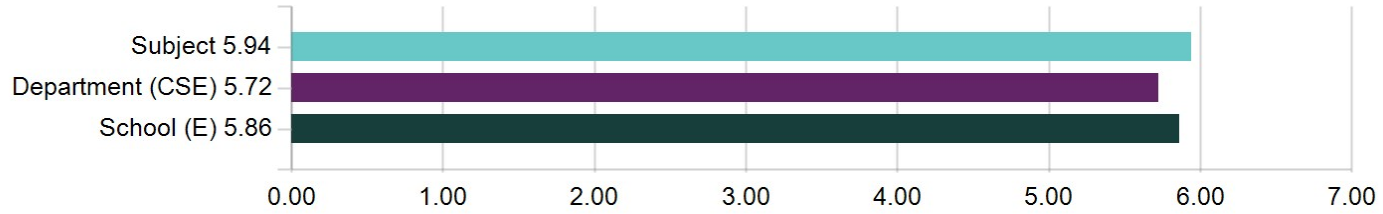



## 8. The course material drew upon real world applications.

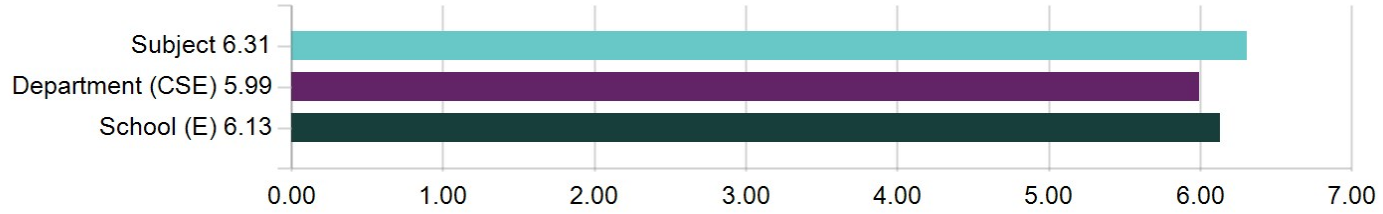


1. Textbooks/readings complemented the lectures.

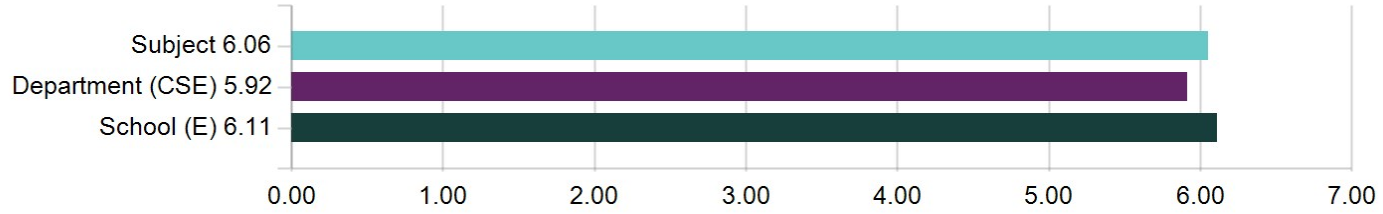

2. Textbooks/readings were useful.



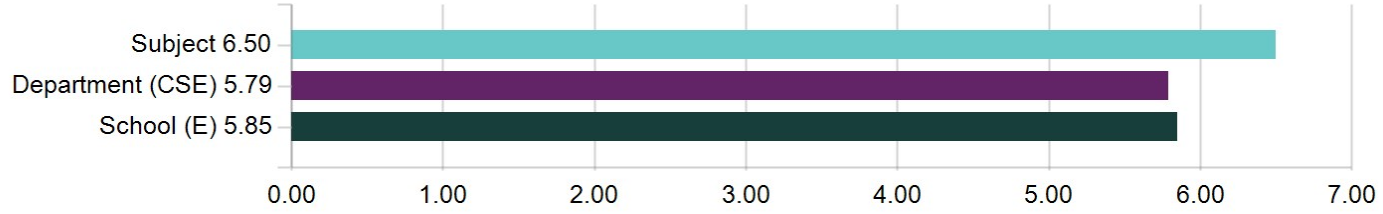

3. Assigned homeworks were helpful and relevant to the course.



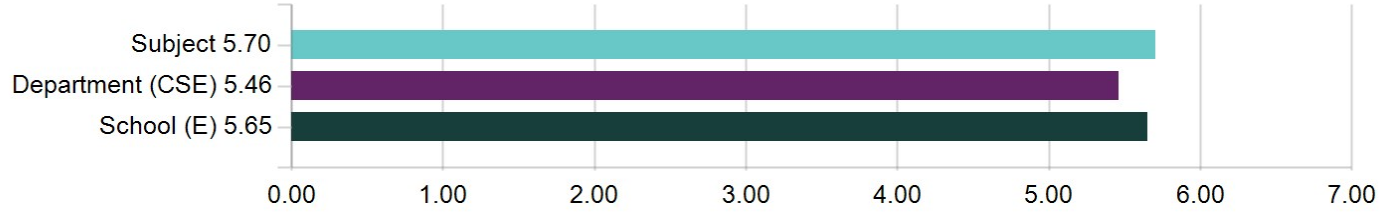

4. There was reasonable time to complete assignments.




5. Assignments were returned within a reasonable period of time.

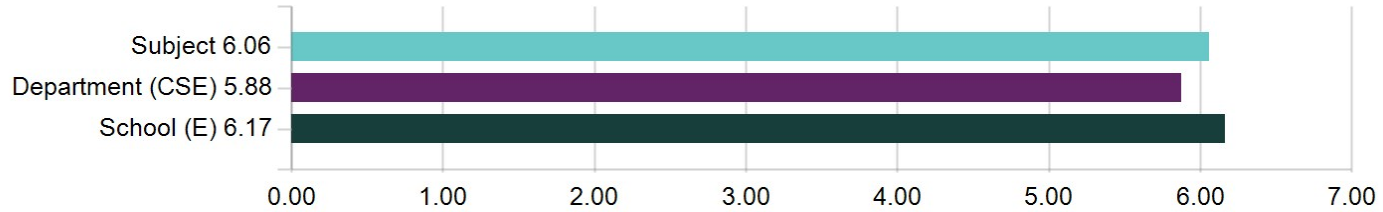



6. Comments on graded work were helpful.



7. Labs were an effective supplement to the course.


8. The course material drew upon real world applications.




### Please elaborate if you felt the textbooks/readings were not useful.

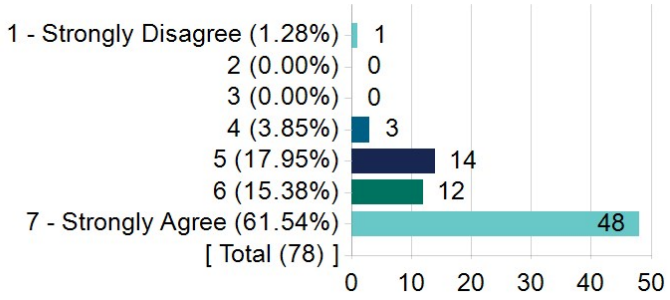
| Comments |
|---|
| Slides were hard to follow as there was a new slide for every line which just made it hard to find what you were looking for when studying. Homeworks were helpful. |
| I want to use this space to highlight just how useful the homework assignments were. Each complemented the lecture material in such a way that completing them enhanced your understanding of the material and extended that knowledge. I believe that the homework structure of this course ought to be a template for similar ones. |
| N/A |
| I had the textbook but I found that Professor Cytron didn't really follow it that much. Which isn't a problem, but it made it hard to get a different perspective. I found youtube to be a more helpful alternative. |
| I tried to read it early on but it was not super helpful. |

## Assistant to the Instructor (AI) and Recitation

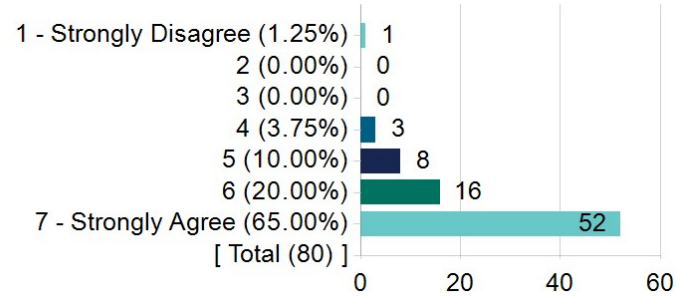
### Rating Scale Responses

| Question | Subject | | | |
|---|---|---|---|---|
| | Response Count | Mean | Standard Deviation | Median |
| The assistant to the instructor was effective. | 78 | 6.29 | 1.09 | 7.00 |
| The assistant to the instructor was available and responsive to questions. | 80 | 6.41 | 1.03 | 7.00 |
| Recitation section served to enhance your understanding of the course material. | 51 | 6.29 | 1.17 | 7.00 |

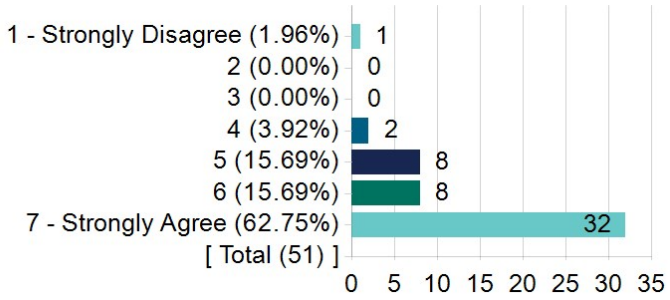
1. The assistant to the instructor was effective.



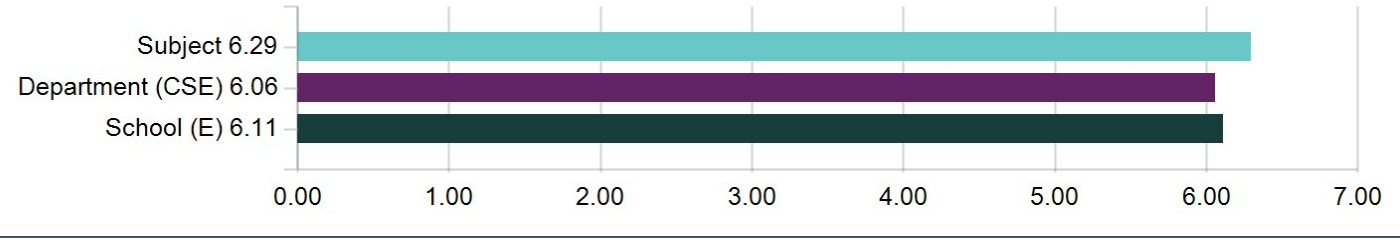

2. The assistant to the instructor was available and responsive to questions.



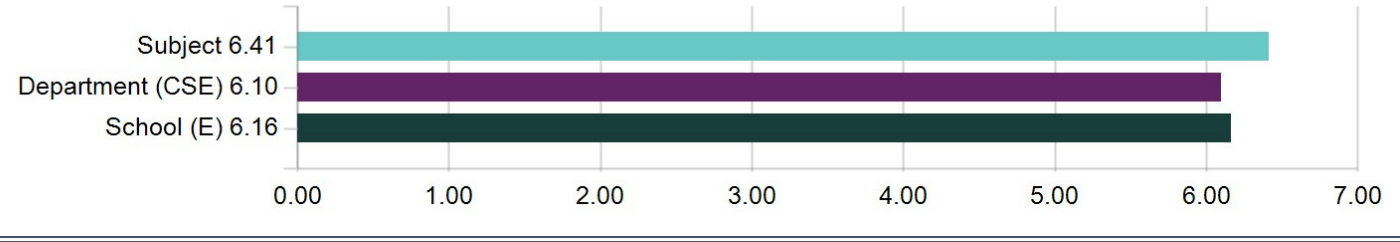

3. Recitation section served to enhance your understanding of the course material.



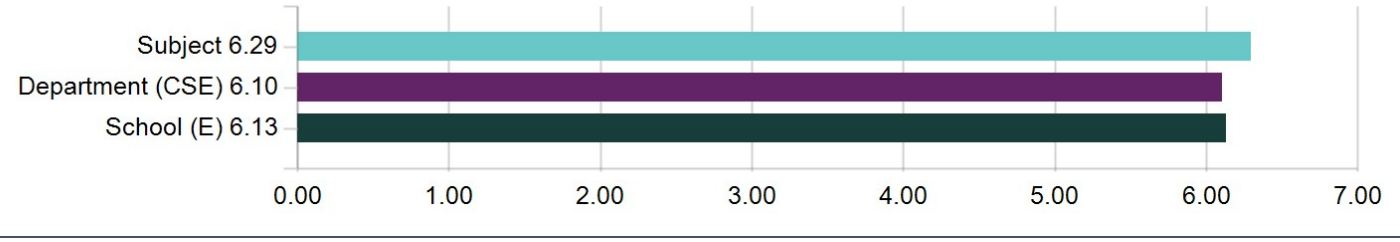

1. The assistant to the instructor was effective.




2. The assistant to the instructor was available and responsive to questions.




3. Recitation section served to enhance your understanding of the course material.



### Please comment on the effectiveness of the assistant to the instructor (AI).

| Comments |
|---|
| zoom office hours were very helpful |
| n/a |
| While there were assistants, I asked the professor for help instead, so I have no real comment or opinion on their effectiveness but I have heard they answer questions well. |
| Very helpful, explained concepts in easily understandable terms, very personable. |
| Liked that they were able to go over assignments with us. |
| Very accessible during office hours. |
| The TAs were very helpful on piazza and during office hours |
| They lied to me on Piazza once but outside of that they were chill. |
| Nolan was great! Actually walked me through how to approach problems instead of giving out answers |
| Some of the TAs were very good |
| When I ask questions they were all very very helpful |
| The TAs were very helpful |
| Nolan did an awesome job of running through things from different perspectives which really helped me understand course material better than I had prior |
| All of the office hours I went to were run well and helpful. |
| The TAs were incredibly helpful over Piazza, and I would imagine that they would maintain that level of instruction in an in–person setting as well. |
| TAs are really helpful in this class |
| I'm going to assume that this means the TAs, who were all always very helpful and always hosted very informative and effective TA hours. But there was no "recitation." |
| I personally didn't interact with the AI so I marked N/A. But I'm sure that they were great and that those who interacted with them could attest to this. |
| The TAs gave very clear explanations for how to approach homework problems. |

### Please comment on the effectiveness of the recitation section.

| Comments |
|---|
| n/a |
| There was no recitation. |
| Knowledgeable on topics covered. |
| N/A |
| I don't believe there was one. |
| I never personally went to office hours, which is the closest thing this course had to a recitation, so I can't really speak to that. |

## Exams and Grade

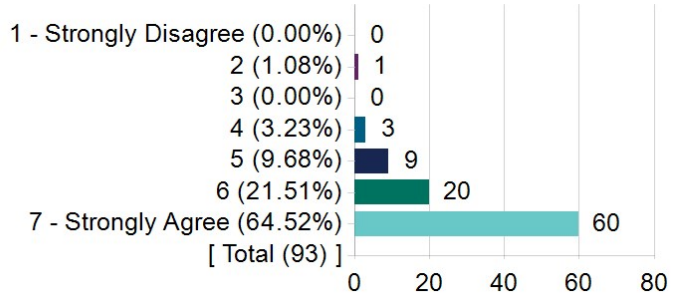
### Expected grade for this course.

| Expected grade for this course. | | |
|---|---|---|
| Options | Count | Percentage |
| A | 70 | 77.78% |
| B | 13 | 14.44% |
| C | 5 | 5.56% |
| D | 0 | 0.00% |
| F | 0 | 0.00% |
| P | 2 | 2.22% |

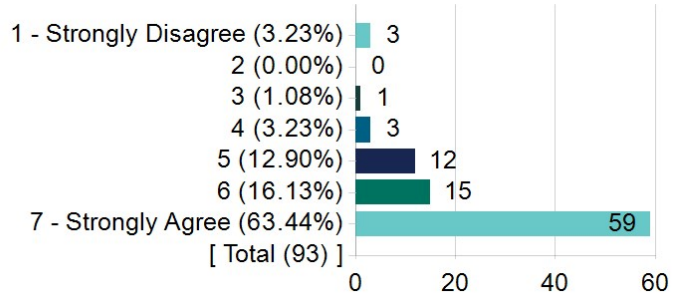
## Rating Scale Responses

| Question | Subject | | | |
|---|---|---|---|---|
| | Response Count | Mean | Standard Deviation | Median |
| Exams reflected material taught. | 93 | 6.44 | 0.93 | 7.00 |
| Adequate time was given to complete exams. | 93 | 6.25 | 1.32 | 7.00 |
| Your grades to this point accurately reflect your understanding of the material. | 93 | 6.09 | 1.26 | 7.00 |
| The grading system was consistent and equitable. | 94 | 6.40 | 1.15 | 7.00 |

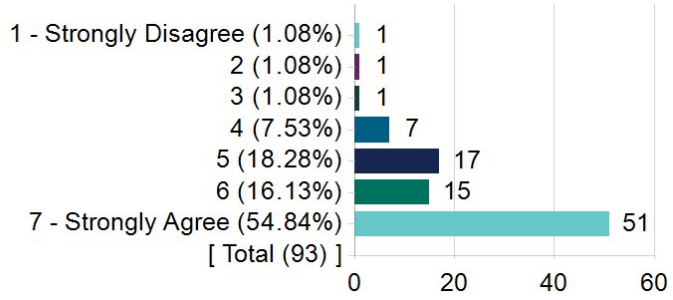
1. Exams reflected material taught.



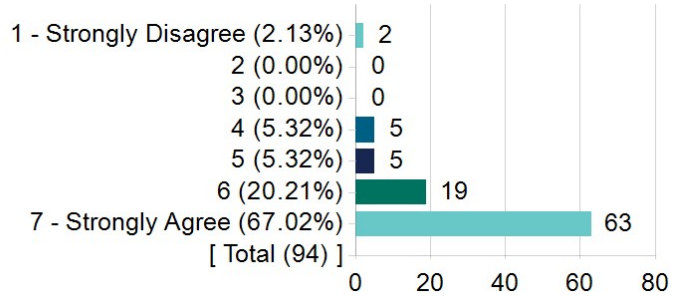

2. Adequate time was given to complete exams.




3. Your grades to this point accurately reflect your understanding of the material.




4. The grading system was consistent and equitable.



1. Exams reflected material taught.


2. Adequate time was given to complete exams.


3. Your grades to this point accurately reflect your understanding of the material.


4. The grading system was consistent and equitable.


**Please elaborate if you felt the grading system was not consistent and equitable.**

| Comments |
| --- |
| I want to use this box to highlight how perfectly timed the exams were. I don't know how Cytron does it, but both felt exact and precise. |
| N/A |
| Two exams only counts a very small percentage of the final grade. And exams are open everything, including the Internet. This is extremely unfair because I saw someone chatting on Discord for answers during the exam. The exam should be much more difficult and closed book. The percentage of exams in final grade should be much higher than now. Almost everyone can get an A with the current exam setting. This can cause serious GPA inflation. Someone who learned almost nothing can still get an A in this course. Same for many other CS courses. Just too easy to get an A. |
| The difficulty of exam is unstable |

## Participation

### Overall

**About how many hours per week did you spend on this course outside of class?**

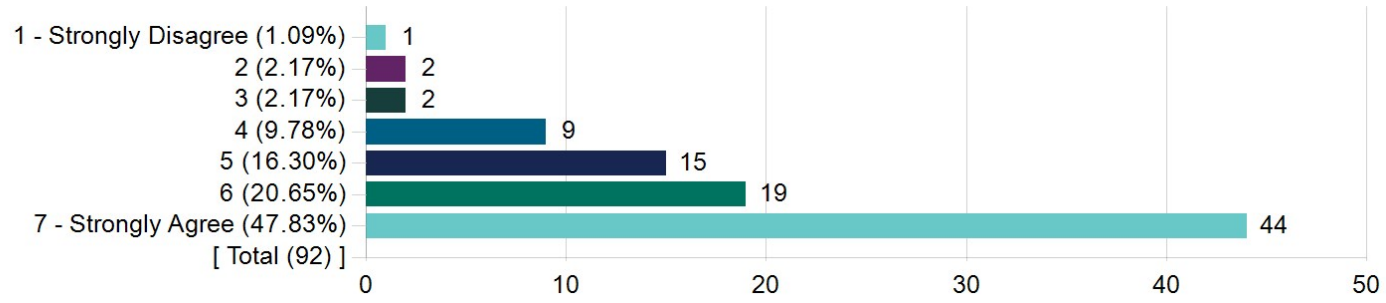
| About how many hours per week did you spend on this course outside of class? | | |
|---|---|---|
| Options | Count | Percentage |
| 0 | 0 | 0.00% |
| 1-3 | 30 | 32.26% |
| 4-6 | 49 | 52.69% |
| 7-9 | 11 | 11.83% |
| 10-12 | 2 | 2.15% |
| 13-15 | 0 | 0.00% |
| Over 15 | 1 | 1.08% |

**What percentage of the lectures did you attend?**

| What percentage of the lectures did you attend? | | |
|---|---|---|
| Options | Count | Percentage |
| 0% | 2 | 2.15% |
| 10% | 5 | 5.38% |
| 20% | 3 | 3.23% |
| 30% | 4 | 4.30% |
| 40% | 2 | 2.15% |
| 50% | 7 | 7.53% |
| 60% | 7 | 7.53% |
| 70% | 12 | 12.90% |
| 80% | 16 | 17.20% |
| 90% | 17 | 18.28% |
| 100% | 18 | 19.35% |

## Would you recommend this course to others?

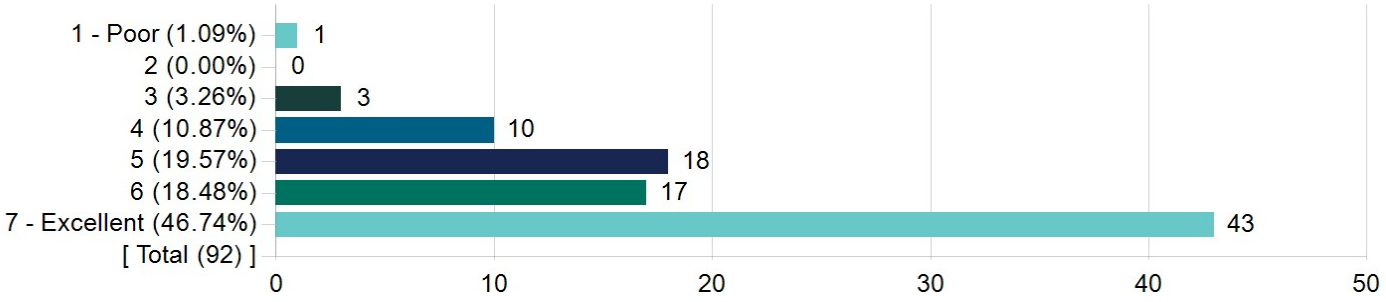
Would you recommend this course to others?




| Statistics | Value |
|---|---|
| Response Count | 92 |
| Mean | 5.91 |
| Median | 6.00 |
| Standard Deviation | 1.36 |

## Overall satisfaction with the course.

Overall satisfaction with the course.




| Statistics | Value |
|---|---|
| Response Count | 92 |
| Mean | 5.90 |
| Median | 6.00 |
| Standard Deviation | 1.29 |

### Any comments on why you did or did not attend lecture?

| Comments |
| --- |
| Its a tough course conceptually, and some days I needed a rest (and knew I'd learn the material better by reviewing slides once I was more mentally rested) |
| Busier school weeks. Most lecture material is uploaded as PowerPoints and attendance was not mandatory so it felt alright to mess lecture 1–2 times to focus on other work. |
| The lectures were hard to follow and I wasn't able to actually understand the content until I was doing it myself on the homeworks or studying for the exam. |
| Office hour/exam conflicts. |
| A lot of the lectures were reading off of the slides, which I could go over later. Also it was my 5th class of the day and I had been in class for 4 straight hours before class started so I was really tired a lot of the time |
| The lectures only partially helped with understanding the content and it was hard to focus. |
| I was sick sometimes :*( |
| didn't attend lecture most of time for physical reasons |
| I am an RA and it ended up falling right around when I would normally have mandatory events |
| Sometimes the lectures were a bit drawn out because Dr. Cytron is very patient with students who don't get basic concepts and they will ask the same questions over and over so I would get bored. But Nothing against the instructor at all, he is just super nice!! |
| busy, other engagements |
| I had a conflict during the second half of class so I had to leave early a lot. |
| I had a conflict sometimes. |
| It was easier for me to learn from reading the slides than from lecture, I just have trouble following sometimes |
| My schedule on Mondays/Wednesdays was incredibly long, and by the end of the day I was usually so tired that I either accidentally fell asleep or wasn't able to really retain the information presented. Had lecture been at an earlier time, I definitely would have attended more frequently. |
| Slides were really well written so attendance wasn't necessary. In person, I did not understand what Ron taught |
| I felt that the slides were sufficient |
| Although I struggled to pay attention in lecture, especially toward the end, the times I did pay attention, it was beneficial for my understanding. At the same time, however, I would walk out of lecture feeling that I understood the concepts and the next day I would be like I have no idea what this concept is anymore. |
| I'm just bad with time management for the couple I missed. Lectures were great. |
| The lecture slides are provided on Canvas, but they tend to be long, so it will probably take you a lot of time to read them on your own. Professor Cytron also does some of his lecturing using the chalkboard rather than the slides, so if you skip class you'd likely miss some important stuff too. |
| The lectures were often paced too slow and spent time covering basic linear algebra. I did not feel like that was a good use of my time in a upper level course to be explained how matrix multiplication works multiple times. |

## Comments

### What did you like most about this course?

| Comments |
| --- |
| I liked how supportive Ron was about the class and how it was very clear he wanted everyone to succeed. |
| I liked how the slides served as the primary way lecture material was taught because it was easier to digest the content. |
| It gave me a different approach to the world |
| Having chance to let my code running on a real quantum computer is amazing! And the content of this lecture is inspiring. |
| It's cool! I now know how to program a real quantum computer. |
| qiskit assignments and problems sets were relatively easy but I learned a lot by doing them. |
| The depth of the content |
| The course material / overall topic of quantum computing. |
| Learning about quantum and what it is |
| The content was completely new to me. |
| Complex topic taught clearly and effectively. |
| It was interesting. |
| I thought the material was really cool and the first half of the course especially was really interesting |
| The TAs were very good |
| It was an interesting topic. |
| The lectures were engaging and the material was extremely interesting. |
| Understanding how quantum computing could have a drastic impact on our lives |
| The material was very interesting and meshed well with another physics course I was taking concurrently. As quantum computing advances, having a solid understanding of its basic workings will become more and more important, especially in cybersecurity. Accordingly, Cytron made sure to highlight where certain topics were pertinent to potential real–world advances. |
| The content was fun |
| I was able to learn the course material really well without having to stress about my grade and exams so much. |
| It was just so interesting |
| I loved the material. I felt like all the assignments were relevant, helpful and interesting. |
| Very interesting |
| The fact that it is about cutting edge tech and we are using real quantum computers |
| The content was really fun. It is a T class that actually felt possible. |
| It is about a relatively new topic that is starting to grow. |
| I found the content to be incredibly interesting, as it forced me to think about computer science in a way that I never had before. |
| the prof |
| I liked that Ron made sure the emphasis was on learning the material. The course was structured in a way that if you did the assignments you got a good grade. |
| Prof. Cytron’s enthusiasm. |
| The TA session |
| While the concepts were difficult, I was glad that the grades did not penalize for that. Practice exams were always available, and the TAs were always helpful. |
| How quantum could break cryptography and offer exponential speed up for some problems compared to a classical computer. |
| I mean, I'm just happy it's offered and that there will be a second course in the fall. |
| The material is very interesting. It made me look at programming in a new way. |
| I liked the very new and unfamiliar material that is applicable today |

### How could this course improve?

| Comments |
| --- |
| Some of the topics were unclear, but it more has to do with how confusing quantum computing is |

| Comments |
| --- |
| It would be helpful if there were slides for the later concepts like Shor's algorithm and Grover's algo |
| Make it more applicable to computer science |
| The coding assignments are great. But the "problem set" assignments and the exams might be a little bit too easy. |
| The lectures could have used more example problems. The theory and proofs are nice, but I often felt that it wasn't until the problem sets that I got a real hands on opportunity to tackle mathematical problems. |
| More examples in the lectures |
| N/A |
| More problem sets. |
| Think of more effective ways to explain the different quantum advantage problems. |
| Each lecture posted on canvas was >80 slides long despite having ~15–20 slides of content (same slides from lecture). These could be condensed to post on canvas so that one additional line is not shown for each slide. |
| I think the second half of this course got pretty repetitive, so learning more about actual quantum applications instead of arbitrary games would be more interesting |
| the slides could be less busy |
| I would have liked to play around with quiskit a little more and running on actual quantum computers. Like just experiencing how noise can mess stuff up would be cool. |
| A little less time per question at the beginning of lecture. There are some great questions asked through the survey, and sometimes it was disappointing to have all of the Q&A time spent on only one or two questions. Maybe it would also be beneficial to place the excel sheet of all the questions gathered (or ones believed to be important by the instructor) on Piazza? That way, we are able to look through and ask for the question to be answered on a Piazza post if it wasn’t addressed in lecture. Some questions I saw were not ones I would think to ask, but always provided beneficial knowledge when they were answered. |
| Record lectures |
| The lectures should have worksheets to do. |
| I doubt many students would agree, but having more time during the week for lecture or discussion would be great. Maybe an optional recitation. |
| N/A |
| Accept late assignments. |
| Not sure, in all honesty. Possibly bringing in the oracle shenanigans earlier? |
| talk more about how quantum as it has to do with cyber security, maybe like one bonus lecture or something |
| If you could record lectures that would be amazing. |
| More qiskits and maybe one less problem set? |
| Honestly I can't think of many ways, as it was incredibly well run, but maybe having a way for students to access notes from the lectures in which critical information was written on the board. |
| no qiskit |
| Shorter, more engaging lectures. |
| Spread out the assignments more evenly |
| with recording choice |
| The slides are great for class, but as a study resource, they can be really difficult to get through because of all the animations. If there was a summary document provided for each module, just overviewing the main concepts and most important details of the module again in a brief way, I feel that that would be a better study resource than the slides, which are very detailed and can bog you down. |
| It could be made a little harder, right now it doesn't feel like a 400–level CS course. Also some more homework problems on post exam 1 material would be helpful (e.g. CHSH, Deutsch–Jozsa, Grover's, etc.) |
| I think having one or two more problems sets could have helped? The problem sets really helped me see what material I knew well and did not, and the quiskit assignments complemented the problem sets very well. (The quantum simulations/IBMQ runs were also very helpful.)<br>But I don't know, maybe not. |
| I often found it difficult to take notes in lecture because there was so much material being covered and I couldn't write it down fast enough. I'm not sure exactly how one would go about this, but I think the lectures could be made more conducive to note–taking. |
| I think some things can be explained more thoroughly and slowed down especially the algorithms by second semester |
| The gradescope system of pre made submission boxes needs to go. That was the most frustrating part of the entire course. |

### What did you like the most about Instructor Ron Cytron?

| Comments |
| --- |
| I liked his commitment to helping students and his passion for quantum computing |
| He's very enthusiastic |
| He is wonderfully outstanding when answering student questions. |
| Passionate and kind professor |
| Fantastic teacher |
| He is very nice and available for questions at any time. His exams are also effective at covering key topics we learned throughout the semester. |
| Very kind and understanding |
| Enjoyable presence. |
| Very accessible and reasonable outside of class |
| He is very interested and excited about the material. |
| He was really good at explaining things and was really nice |
| He speaks clearly |
| He did a good job of encouraging questions and the understanding of the material. |
| So caring and kind, open to any questions |
| I really liked how passionate he is about the material. |
| He was approachable |
| He was very friendly and enthusiastic about this course |
| Cytron is quite possible the best computer science lecturer I have had in my four years at Wash U. His expertise in both teaching and with the material truly shone and each lecture felt very engaging. He never shied from stating when he didn't know something, but conversely answered questions he did know confidently and succinctly, making the pace of lectures smooth. |
| very helpful when asked questions |
| He was very nice and responded to Piazza posts very quickly. |
| Good at explaining things, passionate about the material |
| He is so enthusiastic about the material and very interesting in lectures. He is so patient with all the students and great at explaining complicated concepts. |
| He teaches very fun class and explains things in good details |
| He was very enthusiastic and accomodating |
| He was really kind. He honestly cared about the students and material I loved going to his office hours. |
| He was very organized and accommodating of students |
| Professor Cytron was able to make content that seemed daunting incredibly accessible to someone who has zero knowledge about anything quantum, and did so in a way that was interesting throughout. |
| ability to answer questions |
| He was great. Always explained the material well and very prepared for questions. His enthusiasm was infectious. |
| His enthusiasm and the detailed slides. |
| Love you, Ron! |
| ^^ |
| nice and friendly |
| Ron truly is excited by this topic and loves to teach it. He loves working with students and is sympathetic to their concerns. Ron cares most about students' understanding then whether or not they pass they exam, which is what education is supposed to be all about, so I think that this is the most optimal way of teaching. Ron is very responsive to questions on Piazza. I really liked when Ron would repeat the main points of a concept: "Let me say that again..." It was really helpful to make sure that the main point is driven home |
| He loves quantum computing and breaks down the concepts so students can understand them. He is also very accessible outside of class and responsive to emails. |
| Very passionate about what he teaches, encouraging. |
| The most approachable Professor I have ever had. Really enjoyed the course |

| Comments |
| --- |
| His excitement and passion for the material made the course very engaging. His detailed and well written Beamer slides were very helpful in understanding course material. |
| He is friendly and gives thorough answers to people's questions. I also liked that he uses diagrams to explain concepts very effectively. |
| I think his PowerPoints are very helpful and he is an enthusiastic instructor |
| vigor in consistently updating course materials and checking for errors in his own work. Very kind and engaged with students. Clear he wants to help. |
| I liked how kind Ron was throughout the course. |

### How could Instructor Ron Cytron improve?

| Comments |
| --- |
| Make the slides more condensed and define key terms |
| When questions are not being asked, he moved a bit too quick for me and I could sometimes fall behind. This may not have been everyone's experience though. |
| n/a |
| Closer to the end of the semester, some of the lecture material did not have slides available for them, so it made studying for the final exam more difficult since there was no reference frame to fall back on that was not from the course. |
| Explain concepts in simpler terms/less technical. |
| *see question about slides* |
| His lectures got pretty repetitive and it was easy to tune out of them, he could have more energy during his lectures |
| he could try to make the presentations more varied and interesting |
| He could improve his handwriting and what he wrote on the board was not always helpful to look back on in one's notes. |
| N/A |
| I think the content could be explained in a simpler to understand way (especially the last half of the class). |
| Sometimes when asking questions he jumps ahead to the answer before you can finish asking, which sometimes leads to confusion. |
| N/A |
| I got nothing, he was batting 1000 |
| Instead of always answering every question, he could maybe ask more people to ask them after class or come to office hours after trying to explain a concept once or twice. |
| nothing |
| Maybe start off explaining things at a lower level. I feel like we jumped right into the proofs and theory quickly. |
| Quite frankly I would struggle to think of a way in which Professor Cytron could improve. He was by far the best professor I've had for a class in my college career so far. |
| move slower through slides |
| Being more engaging during lecture. |
| Describe things in a more relatable way. Post condensed slides, all the lectures are 100 slides plus but a lot are the same slide. It’s a little annoying going through the slides in order to study. |
| I really liked when Ron would repeat the main points of a concept: "Let me say that again..." It was really helpful to make sure that the main point is driven home, and I in fact wish he would do it even more often for such difficult concepts. Ron can be a bit stingy on Piazza with explaining answers, often referring you to the slides than to explain the concept right there in the comment thread. |
| I think if powerpoints had some more details since the material is pretty comlex |
| Pick up the pace while lecturing. |

### What would you tell another student who asked you to describe this course?

| Comments |
| --- |
| Good grading system and course content for theoretical computer science class |
| It's tough, but its cool. |
| great class |
| If one was interested in quantum mechanics and their applications in computing without needing to know much about the physics behind quantum, this course will cover the mathematics behind quantum, important quantum concepts, and the difference between simulated and actual quantum devices. |
| It is very introductory and while many of the concepts are confusing the computation is not too bad. |
| The course is taught at a good pace. I recommend going to OH to understand the problems instead of searching on your own since the content isn't as widespread as others. The professor is a funny and nice guy. |
| Will learn a lot during semester. |
| Pretty challenging but really interesting material |
| difficult material, but taught well |
| It is cool course that introduces quantum computing and what it can do. |
| A fun introduction to quantum computing that is challenging but not all–consuming. |
| Easy to do well in but hard to understand the concepts |
| The course covers the fundamentals of quantum computing without any physics knowledge required. The first half of the semester focuses on the building blocks of quantum computing, while the second half turns towards using those blocks to investigate quantum algorithms. |
| a very good course |
| You learn the basics and theory behind quantum computing in a low stress environment. You can expect to learn the material very well. |
| Super interesting but definitely requires an open mind in regards to computation |
| It's very fun, interesting, and useful. It's accessible to beginners but isn't boring for those slightly more advanced. |
| In lecture you go through a lot of math and other stuff, but the actual tests, and assignments are much more about application which is reassuring. |
| The content was difficult to understand but it was a fair class and taught well. |
| Think about Schrodingers cat, then apply that to a computer. That idea is a gateway into the world of quantum computing and the material that will be covered. While not necessarily pratically useful right now, it very well may in the future, and is incredibly interesting to learn about regardless. |
| to start qiskit early |
| Heavier in the first part of the semester, but homeworks are helpful for understanding and it was never an overwhelming course. |
| It is not that time consuming and very interesting and you get to code on an actual quantum computer. |
| Worth taking. |
| The course might be useful for students who want to do research |
| The concepts can be very difficult if you don't already have a physics background, but the professor isn't there to tank your grade. Go to TA and office hours and you will do well. |
| Challenging and interesting content but very fair grading |
| The workload isn't too heavy, but the concepts can get very confusing. This is a very theoretical class, so be prepared to do lots of thinking. Start assignments early. |
| I think this course is very useful and I encourage you to take it |

### Have you observed any violations of academic integrity (e.g., cheating) in this course?

| Comments |
| --- |
| No |
| No. |
| no |
| no |
| No |
| NA |
| No |
| No. |
| no |
| no |
| nope |
| Did hear someone mention that a student in a past class gave them their graded exams from last year. |
| N/A |
| no |
| n/a |
| N/A |
| Nope |
| No |
| no |
| No. |
| n/a |
| no |
| no |
| Nope |
| N/a |
| no |
| No |

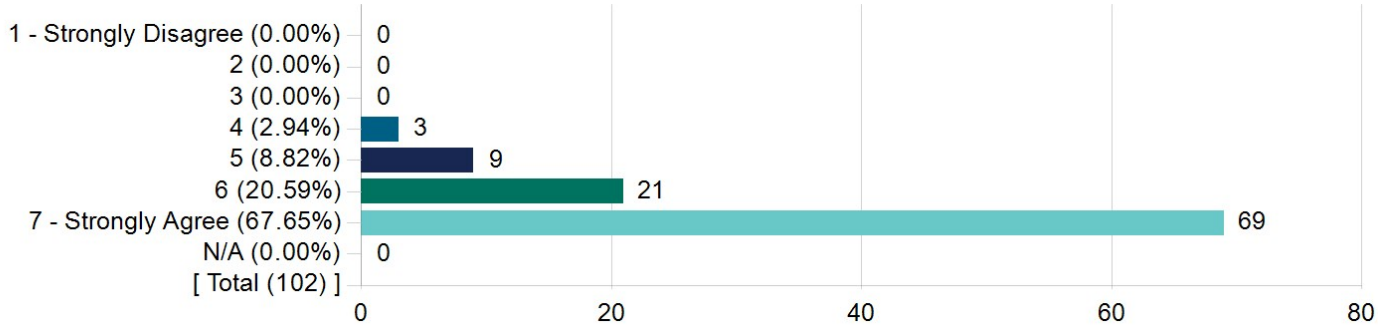
### Any additional comments?

| Comments |
| --- |
| no |
| N/A |
| No |
| no |
| N/A |
| This is one of the best classes I've taken at WashU. I learned all of the course material really well because I attended lecture, did the assignments, and studied for the exams. While I learned a lot, this class also did not cause a lot of stress for me. |
| N/A |
| It was a great semester I am sad it is over. |
| I'm excited for the next course in the fall. |

## Danforth Question

**The course Canvas page or website could be easily navigated to find course materials.**

The course Canvas page or website could be easily navigated to find course materials.




| Statistics | Value |
|---|---|
| Mean | 6.53 |
| Median | 7.00 |
| Mode | 7 |
| Standard Deviation | 0.78 |