# University of Michigan
# Fall 2020 Preliminary Instructor Report With Comments
# ROB 101-001: Comp Lin Alg
# Jessy Grizzle

23 out of 27 students responded to this evaluation.

**Responses to questions about the course:**

| | SA | A | N | D | SD | N/A | Median |
|---|---|---|---|---|---|---|---|
| This course advanced my understanding of the subject matter.(Q1631) | 15 | 8 | 0 | 0 | 0 | 0 | 4.7 |
| My interest in the subject has increased because of this course.(Q1632) | 14 | 8 | 0 | 1 | 0 | 0 | 4.7 |
| I knew what was expected of me in this course.(Q1633) | 15 | 8 | 0 | 0 | 0 | 0 | 4.7 |
| Overall, this was an excellent course.(Q1) | 15 | 8 | 0 | 0 | 0 | 0 | 4.7 |
| I had a strong desire to take this course.(Q4) | 11 | 11 | 0 | 1 | 0 | 0 | 4.5 |
| As compared with other courses of equal credit, the workload for this course was...(Q891) | 1 | 4 | 9 | 7 | 1 | 1 | 2.8 |
| How did you participate in this course? (Q1854) | 5 | 4 | 8 | 6 | 0 | 0 | 3.2 |
| I gained a good understanding of concepts/principles in this field. (Q121) | 12 | 10 | 0 | 1 | 0 | 0 | 4.5 |
| The amount of work required was appropriate for the credit received. (Q239) | 7 | 14 | 2 | 0 | 0 | 0 | 4.2 |
| Grades were assigned fairly and impartially. (Q365) | 15 | 7 | 1 | 0 | 0 | 0 | 4.7 |

**Responses to questions about the instructor:**

| | SA | A | N | D | SD | N/A | Median |
|---|---|---|---|---|---|---|---|
| Overall, Jessy Grizzle was an excellent teacher.(Q2) | 20 | 3 | 0 | 0 | 0 | 0 | 4.9 |
| Jessy Grizzle seemed well prepared for class meetings.(Q230) | 20 | 3 | 0 | 0 | 0 | 0 | 4.9 |
| Jessy Grizzle explained material clearly.(Q199) | 15 | 7 | 0 | 0 | 1 | 0 | 4.7 |
| Jessy Grizzle treated students with respect.(Q217) | 22 | 1 | 0 | 0 | 0 | 0 | 5.0 |
| Jessy Grizzle appeared to have a thorough knowledge of the subject. (Q207) | 21 | 2 | 0 | 0 | 0 | 0 | 5.0 |
| Jessy Grizzle acknowledged all questions insofar as possible. (Q216) | 20 | 3 | 0 | 0 | 0 | 0 | 4.9 |

## Written Comments

### Given the format of the course (e.g., fully online, in-person, etc.), what teaching methods worked well? (Q1855)

| Comments |
| --- |
| I pretty enjoy the format of this course this semester, which is in–person and synchronously online at the same time. I got a very good learning experience. |
| I enjoyed being able to visit the classes in person, which made taking notes and learning much easier. |
| I really appreciated the in– person format. |
| In person |
| Seemed like a normal lecture — felt like precovid days. |
| The course was hybrid, but they made sure that all students would get the help they needed via extra zoom meetings, piazza, etc. |
| The hybrid design worked great it gave me the opportunity to go when I needed but also do the class on my own time. |
| Lecturing usually worked well although sometimes it was hard to completely understand everything the first time around. |
| I found that coming to classes in–person was much more beneficial to my understanding |
| I loved the lectures. I thought they were very well done.<br>I also liked the piazza activity. |
| Adding to notes during lecture and uploading them afterwards was very helpful. The content was clear from both virtual and in–person perspectives. Piazza was very helpful for asynchronous interaction. The course booklet is great and I like the way it's written. I like how key concepts are boxed/highlighted. |
| The lectures were helpful. |
| For the async lectures, I liked being able to follow along with the shared notes. |
| The in–person format worked well. |
| the option to watch videos async or attend in person or watch live zoom gave me a ton of flexibility and I used all three options throughout the term based on my day–to–day schedule. That was good. Also, Rob 101 Piazza was my favorite Piazza. It was super active but not so many posts that stuff got forgotten/ignored. |
| I liked having the class available in asynchronous videos as well in person |
| Completed in other eval. |
| I really liked the format of the homework and how there were both drill problems and Julia problems. |
| The lectures were nice, and it was in–person which gave me motivation to step out of bed |
| The hybrid method was great because we had the opportunity to attend in–person, where the material was better received, but also had the option of following remotely when we wanted. Helped to know we had access to in–person help when needed. |
| I think office hours were most helpful. |

### What were the greatest challenges to your learning in this course format? (Q1856)

| Comments |
| --- |
| Not really. |
| I think it was hard to manage the workload of all my classes in general, since there seemed to be no way to organize everything easily. |
| Trying to put the linear algebra into code. |
| Learning new notation |
| Seemed like a normal lecture — felt like precovid days. |
| It was harder to ask questions and get immediate responses. |
| Sometimes it is hard to actually watch the lectures online but this class was interesting so I had a desire to watch the lectures. |
| When I moved to online classes, the hardest part was making myself pay full attention to the lecture. This isn't specific to this class, rather this is true of all online classes. |
| None, I had the option for in–person, synchronous, async, and there were office hours! |
| Having to stare at my screen for 8+ hrs a day |
| I wouldn't say it was a hindrance to my learning, but I did miss out on a lot of interaction with my peers in the virtual/social distanced format. |
| Not much that hindered my learning of the material – there were plenty of resources. |
| It was hard to learn the programming at first with most of the lecture focusing on only the math aspect of the course. |
| I do think that some more open–endedness on the projects would be cool. However I still learned a ton from them so this isn't a big deal (especially project 2 and 3). |
| none |
| Completed in other eval. |
| I wish there was better documentation of Julia. |
| Nothing much, everything was pretty straightforward |
| It was my first time coding and it was hard to keep up. |

### Which aspects of this course were most valuable? (Q908)

| Comments |
| --- |
| The theory of linear algebra and its practice through Julia. |
| I think the applications of linear algebra was the most valuable part of this course. |
| I really liked learning the real life applications to robotics like all the projects were super fascination. |
| In person |
| I think the drill homework and julia homework really reinforced the topics in class and furthered my understanding. Also clarified any confusion I had. |
| The practical applications of this course were very interesting. |
| The ability to do it whenever and the projects were engaging |
| Doing homework (both written and Julia) was really important for my learning, mainly because it forced me to sit down with the textbook and notes and actually understand the material well.<br><br>Projects were helpful for the same reasons as Homework, and the had the added benefit of showing us really cool applications to the things we were learning, which I think is super important for motivation to learn. |
| Introduction to linear algebra |
| The introduction to linear algebra, specifically least–squares solutions to systems of equations was most useful. Having very little linear algebra knowledge before this class, it was super fun to learn. |
| Optimization was my favorite topic since it combined a lot of the things we learned, and I had a better appreciation for its applicability to engineering problems. |
| The projects and homework were very helpful and enjoyable. The textbook was also very helpful. |
| I loved the projects for using methods we've learned on a large scale. |
| The weekly hw assignments really helped me to learn the material, they also helped me to see what the material we learned about in class allowed us to do, which was interesting. |
| The projects are really great. I haven't completed project 3 yet so maybe my opinion will change, but project 2 was my favorite. Also, I found the last couple chapters particularly interesting. Seeing the example with callibrating the LIDAR and images and the applications of the Hessian/Jacobian/Gradient was probably my favorite chapter of the book. |
| Seeing up close how concepts are used in the real world |
| As I am looking to be a computer science major, I found the optimization unit to be most valuable. |
| The booklet that the professors created was REALLY valuable. If I didn't understand anything, I could always rely on it to clarify concepts. The big green boxes were especially useful in organizing information. |
| I liked the HW sets. They were thorough enough that I got a good understanding but yet didn't seem like I was doing unnecessary work.<br>The julia projects also helped reinforce the idea about working with large numbers |
| The computational aspect of the course in Julia was really helpful because it helped build my interest in programming and showed me how it may be applied. |
| I think the recitation were most valuable. |

### Which aspects of this course were least valuable? (Q909)

| Comments |
| --- |
| Not really. |
| I think the least valuable part was the background around LU factorization when QR is used much more often. |
| none |
| n/a |
| N/A |
| I thought the very first chapter was a little too basic. |
| The quizzes felt unnecessary and made me feel like not doing them at all if it didnt hurt my grade so much. |
| The quizzes weren't all that helpful, since they were infrequent and just felt like an easier extension to the homework. If the intention was to test us in a way where we wouldn't be able to look things up or reread the textbook, I don't think it worked. |
| Julia, although I believe that coding was a core part of this course, I think we should've used MatLab |
| I feel everything taught has significant value. |
| The introduction to systems of linear equations felt a bit drawn out/trivial. While I think it is important to understand, the discussion of subspaces felt a bit technical and just like learning vocabulary rather than something essential to other course content. |
| I felt all the aspects of this course were very valuable in helping me learn about computational linear algebra. I did not attend many recitations. |
| If I had to be picky, I think sometimes the Julia homework assignments/projects can be a bit finicky in terms of how much work is required. I think sometimes the projects might take even less effort than regular homework! |
| I didn't feel I gained much from doing the five quizzes. |
| Heavy and slightly stressful workload |
| I thought the quizzes were the least valuable. |
| I found the recitations to not be of much help but that could be just me. |
| If it wasn't for my tutor I would have needed more coding help. |

### Please comment on the quality of the course as a whole. (Q911)

| Comments |
| --- |
| Extraordinary. |
| The course overall was very cool and interesting, but also very difficult to wrap my head around. |
| Very great! Surpassed expectations. |
| Good pilot semester |
| Overall it was good, I wish we went over more numerical examples in lecture however. |
| The quality of this course as a whole is wonderful, given that this is its first semester. |
| I enjoyed the class and thought it was interesting engaging and informational. I learned a lot more from this class than I expected and gained new passions because of this class. |
| Overall this was a really enjoyable class, and I think probably the best way to learn linear algebra if you don't love math and do love robotics/technology. It does a great job of teaching useful things and integrating the pure math with applied programming. It obviously needs a little polishing, but what pilot class doesn't? |
| Great |
| I loved it! |
| This course has been fantastic. I signed up looking for a relatively low–stakes opportunity to explore/learn something new & gain some real engineering skills and this course delivered and then some. My only frustration is that the pace felt slow–going at first, and the really interesting stuff came as bonus content at the end. Of course I recognize that this course assumes basic math background, so I would not be the target audience. For the target audience, I think the course is structured really well! In hindsight, I would like to have taken a ROB 101+ where we could skip some of the intro chapters and get right to the good stuff :). |
| The course is a very enjoyable introduction to computational linear algebra. The projects are interesting and frustrating assignments that improved my understanding of how linear algebra is applied in the real world. I would've liked to learn about row–echelon forms, however, as that would've made some of the content in class easier to work through. |
| The course is great at being a 101 course – and quite a bit past that. It taught us a lot about Linear Algebra approaches to solve engineering problems, and I think the demonstration of aligning the LiDAR and camera data for Ch 11 really illustrated this.<br>That said, there is room for improvement. I think the pace of the course can be evened out a bit more. In particular, the later chapters felt a bit rushed for me, and the temporarily added stuff about hyperplanes and such should be organized more. |
| I think this is an excellent course. I was so excited to be able to take a robotics course in my first semester and I was not let down by this course. Taking this course has made me start to seriously consider majoring in robotics and perhaps perusing a career in robotics. |
| I loved Rob 101, it was my favorite course this semester. Its a great course no doubt. |
| Good professor, homework and projects are sometimes a little hard |
| I had a really enjoyable semester with ROB101 and I am interested in future courses such as ROB103. |
| I thought it was really well done. |
| Best course I took this semester |
| Great class, would definitely recommend. |
| I think the quality of this course is a 10/10. |

### How can Jessy Grizzle improve the teaching of this course? (Q901)

| Comments |
| --- |
| Not really. Thank you professor very much. |
| I think if there was more guidance on some of the Julia side of things, this course could've been better. |
| Maybe add a lab element so the coding comes easier. |
| Live demonstrations of julia code |
| N/A. Professor Grizzle was always engaged which made me want to pay attention to the material. |
| get rid of the first chapter and spend more time doing problems similar to those on the hw. |
| The only suggestion I would make is to add more quiz questions and do two tries on the quizzes with mixed questions of equal difficulty if you seem fit. |
| I wish there had been homework for the last few weeks of "additional" material, as that would've helped me understand the concepts better and then it would've been easier to follow along in lecture.<br><br>The one thing I didn't like about projects was how much more heavily they were weighted. Since Projects were usually only a little bit more work than homework assignments, it didn't make sense to me that they were weighted so much more heavily. I think either the homeworks should be weighted more evenly with projects, or the projects should be much bigger than the homeworks. |
| More help with the coding |
| From a teaching perspective, Professor Grizzle did an amazing job.<br><br>One small thing, the Julia homeworks and projects sometimes felt like I was just debugging someone else's code, rather than writing my own. I think more could be done to introduce students to writing complete programs (though I recognize this may be out of the scope of the course). |
| This course definitely stands out as the best class I've had this semester. It is clear that the professors really care and they demonstrate it by actively helping students succeed. Thank you, Professor Grizzle! This class has been such an amazing experience that has increased my confidence and interest in engineering. Your commitment to all of us means a lot. I love being able to look forward to coming to class and to being met by a professor who is excited to show us the power of linear algebra :) |
| Spread out the material more evenly. I think the first few chapters can be done a bit faster, while the later chapters deserve a bit more time because it covers a lot of material.<br><br>Maybe add another assignment towards the end for a complete cheatsheet! I liked the idea of HW6 being making a cheatsheet by ourselves, but the lack of a final one demotivates (at least some) students from completing it.<br><br>Make the projects a bit more complex/require more work than homework assignments. Some projects are too trivial in terms of effort and are easier/less time consuming than most homeworks!<br><br>For Julia stuff in general – add tests for the student's functions. The tests are already there for most problems, but when there is a complex one with nothing other than autograder cells, it looks intimidating and leaves us in a sort of suspense. Then again, maybe it's okay to not do that considering that's basically giving away the solution.<br><br>This is a great course! I'm glad I piloted it. |
| I would like it if the lectures focused just a little bit more on the programming aspect of the course, rather than only on the math. |
| I do think that some more open–endedness on the projects would be cool. However I still learned a ton from them so this is just a small thing really. I think most of the other small things that could've made the course better will automatically be better next semester since this was the first time it was offered (e.g. bugs in projects and whatnot). Finally, I think more real–world examples and applications in the Textbook would be nice to have. |
| Have more examples during lecture to better understand material (especially abstract/theoretical concepts) |
| I felt that the current format was perfect. |
| I think timed quizzes and a final would really force us to study and reinforce the material. |
| More guidance with Julia at the beginning of the term would be great. Also, some more opportunities to work in groups might help learn the material better. |
| I think he had great energy and made lectures entertaining. |