



Fall 2020 Individual Report FAS-NEUROBIO 212- Mathematical Tools for Neuroscience 001 Lucy Lai

Project Title: **2020 Fall Harvard FAS Course Evaluation**

Course Audience: **15**
Responses Received: **11**
Response Ratio: **73%**

Report Comments

Note:

The order that the questions appear on this report is not the same as the way the questions were displayed to students. The order has been changed to make the report more readable.

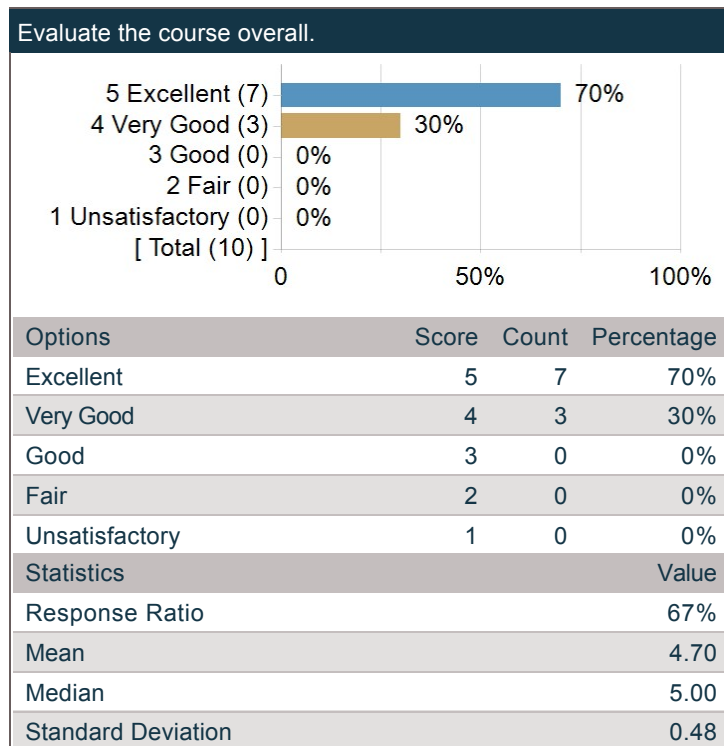
Creation Date: **Wednesday, December 23, 2020**

General Course Questions

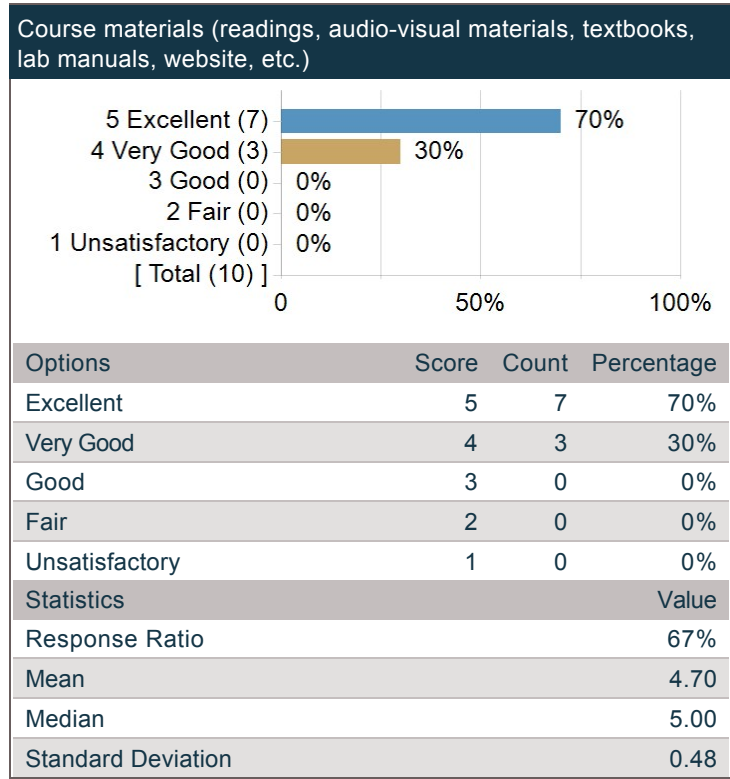
Course General Questions

	Count	Excellent	Very Good	Good	Fair	Unsatisfactory	Course Mean	Dept Mean	Division Mean
Evaluate the course overall.	10	70%	30%	0%	0%	0%	4.70	3.91	4.12
Course materials (readings, audio-visual materials, textbooks, lab manuals, website, etc.)	10	70%	30%	0%	0%	0%	4.70	3.88	4.17
Assignments (exams, essays, problem sets, language homework, etc.)	10	60%	40%	0%	0%	0%	4.60	3.73	3.94
Feedback you received on work you produced in this course	10	30%	60%	10%	0%	0%	4.20	3.71	3.89
Section component of the course	6	50%	50%	0%	0%	0%	4.50	4.01	4.11

Evaluate the course overall.



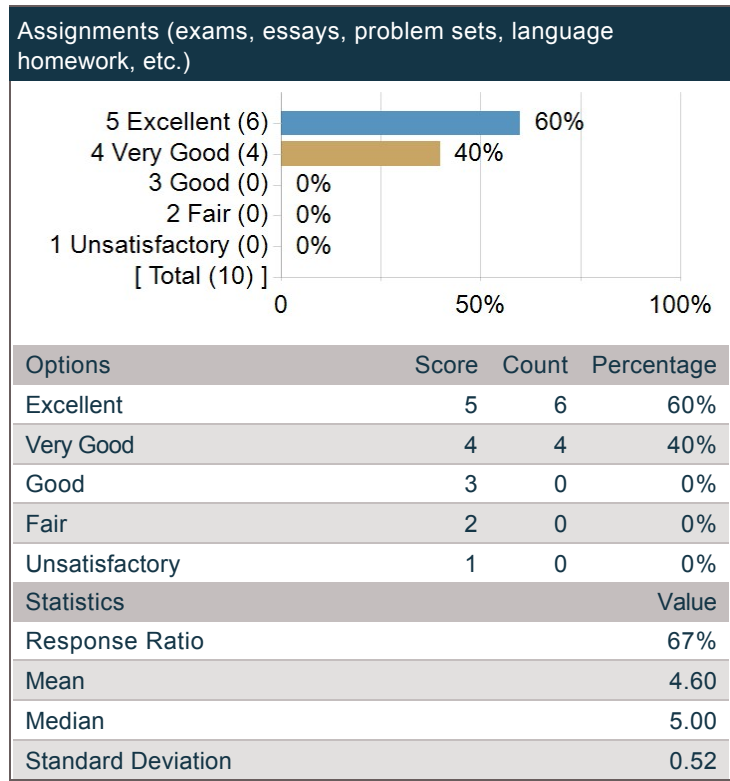
Course materials (readings, audio-visual materials, textbooks, lab manuals, website, etc.)



Add comments about course materials?

Comments
Loved them! Very informative.
Great lectures
The lectures were all excellent, and I will continue to reference them regularly going forward.
Very well done. Thorough explanations. Videos well divided (and well timed, not too long). Tutorials were great.

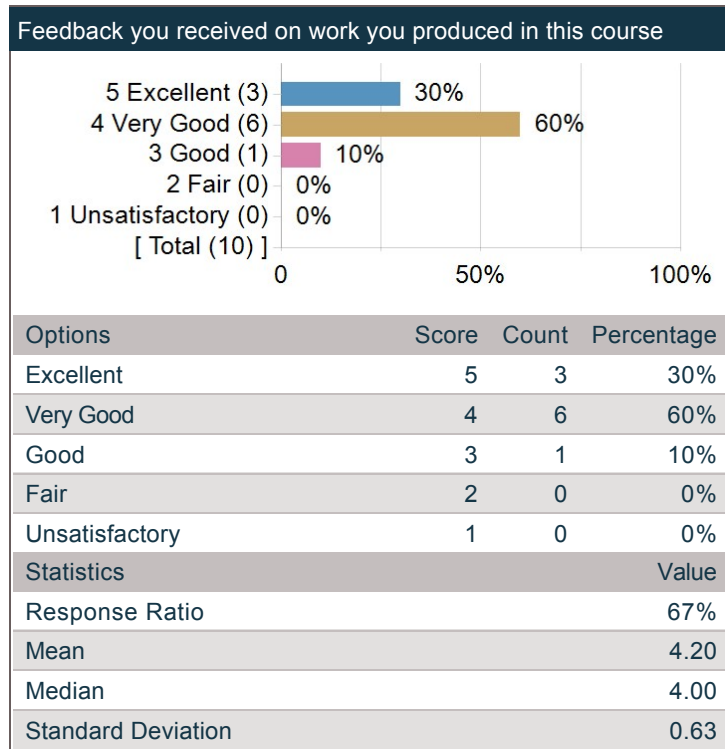
Assignments (exams, essays, problem sets, language homework, etc.)



Add comments about course assignments?

Comments
Really helped cement/clarify concepts!
The tutorials were fantastic! They expertly guided us through the material and allowed us to learn while also applying the principles we were learning. I found them incredibly valuable.
The tutorials were great.

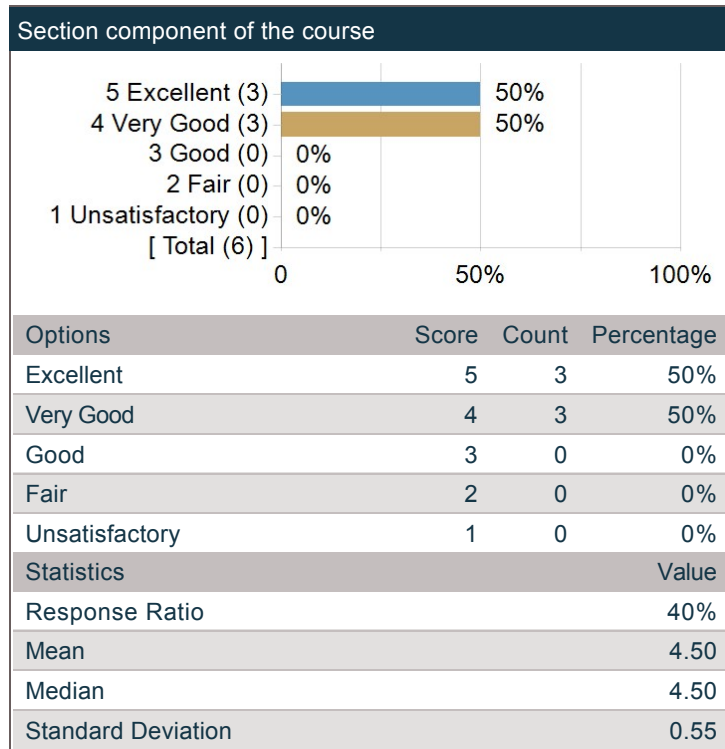
Feedback you received on work you produced in this course



Add comments about course feedback?

Comments
Feedback on tutorials could be more detailed
Great, personalized feedback on tutorial questions.
Tutorial solutions are posted after every week, allowing us to see what we did wrong. The tutorials are almost always timely graded, so we knew what we did wrong. Many of the difficult points, which most of the class was confused about, was then revised in class in the following session.

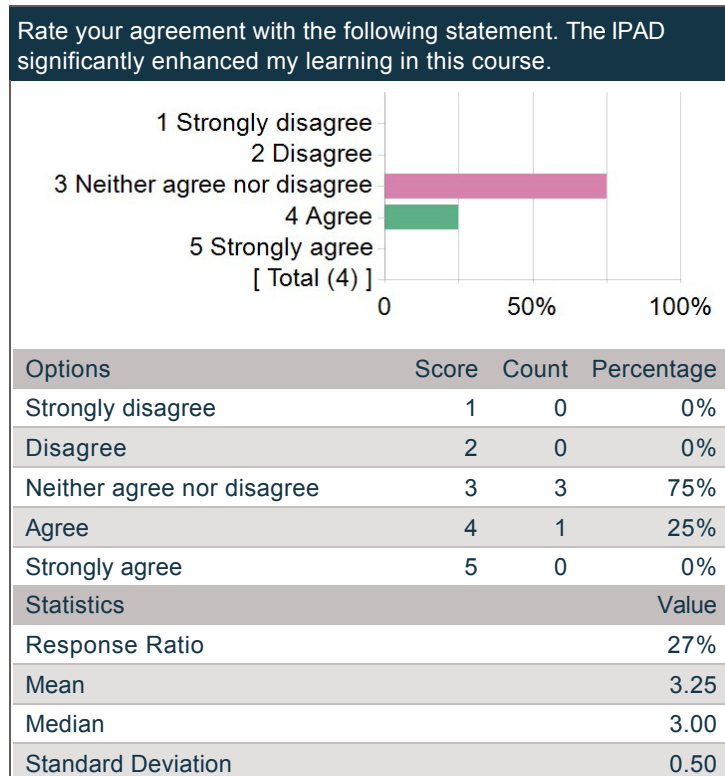
Section component of the course



Add comments about the course section?

Comments
Really made things click.

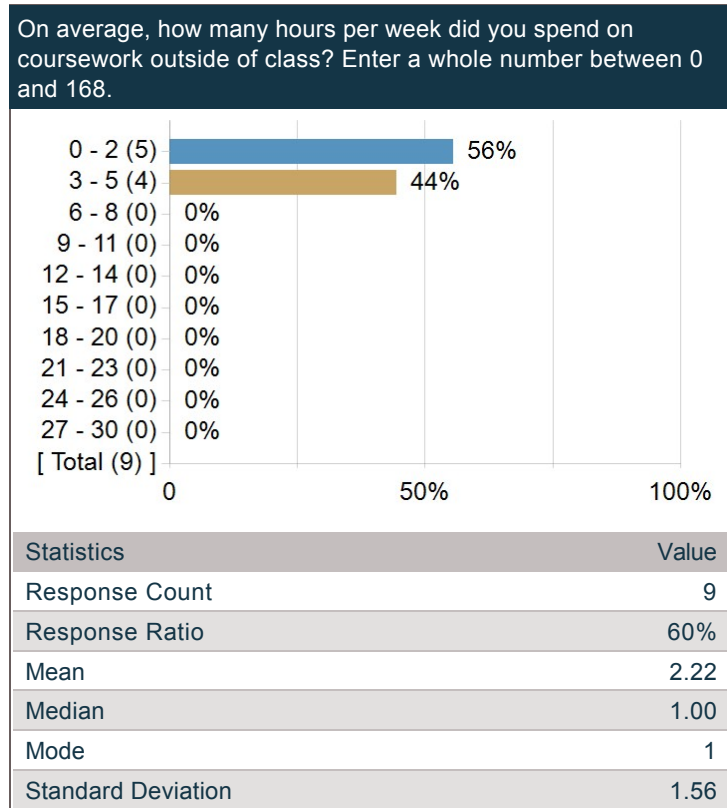
Rate your agreement with the following statement. The IPAD significantly enhanced my learning in this course.



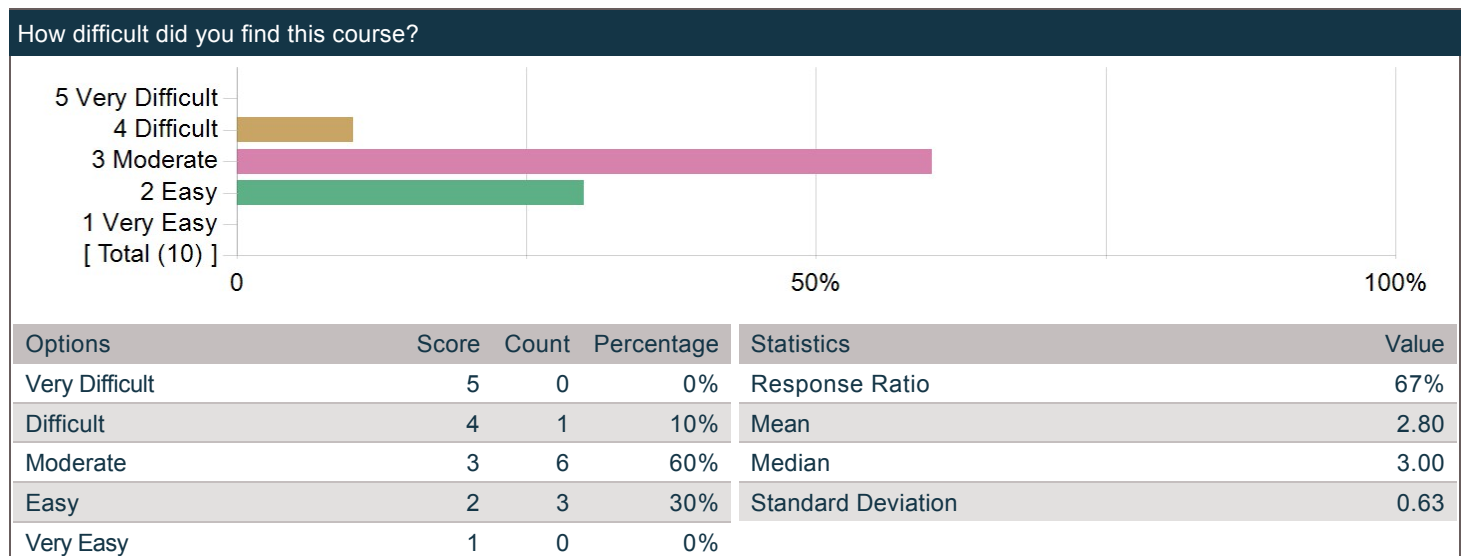
Requirements - What did this course require of you?

On average, how many hours per week did you spend on coursework outside of class? Enter a whole number between 0 and 168.

Frequency chart and mean excludes students who answered 31 or more hours.



How difficult did you find this course?

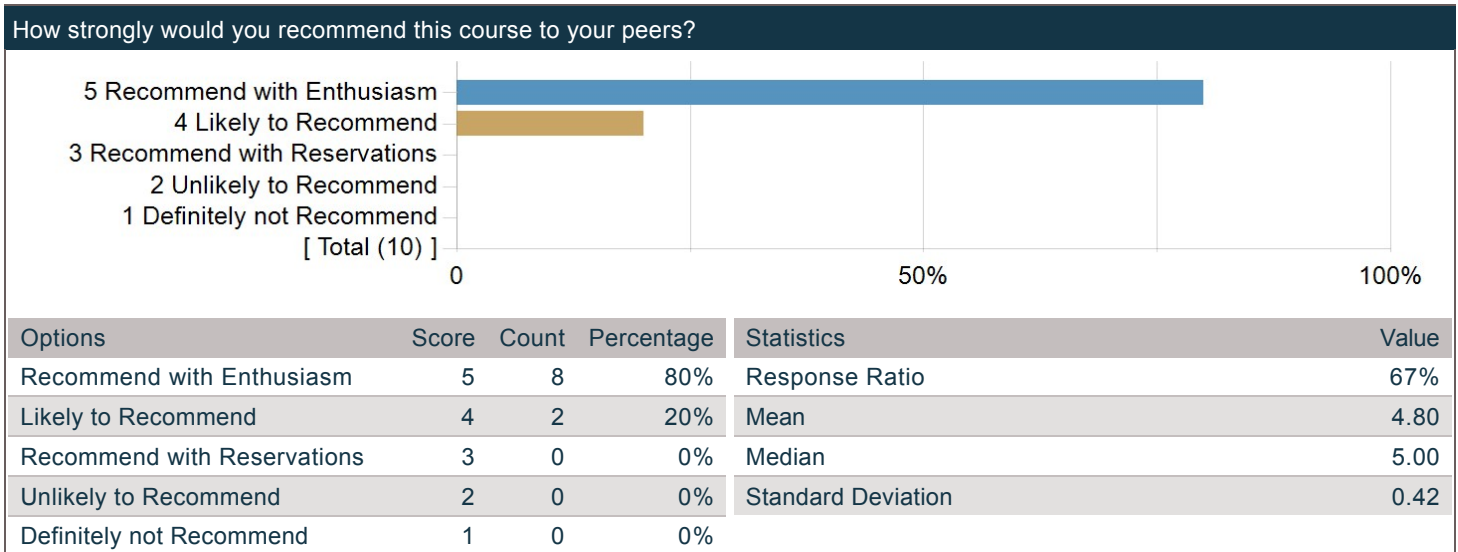


What was/were your reason(s) for enrolling in this course? (Please check all that apply)

Options	Count
Elective	9
Concentration or Department Requirement	2
Secondary Field or Language Citation Requirement	0
Undergraduate General Education Requirement	0
Expository Writing Requirement	0
Foreign Language Requirement	0
Pre-Med Requirement	0
Divisional Distribution Requirement	0
Quantitative Reasoning with Data Requirement	1

Recommendations - Would you recommend this course?

How strongly would you recommend this course to your peers?



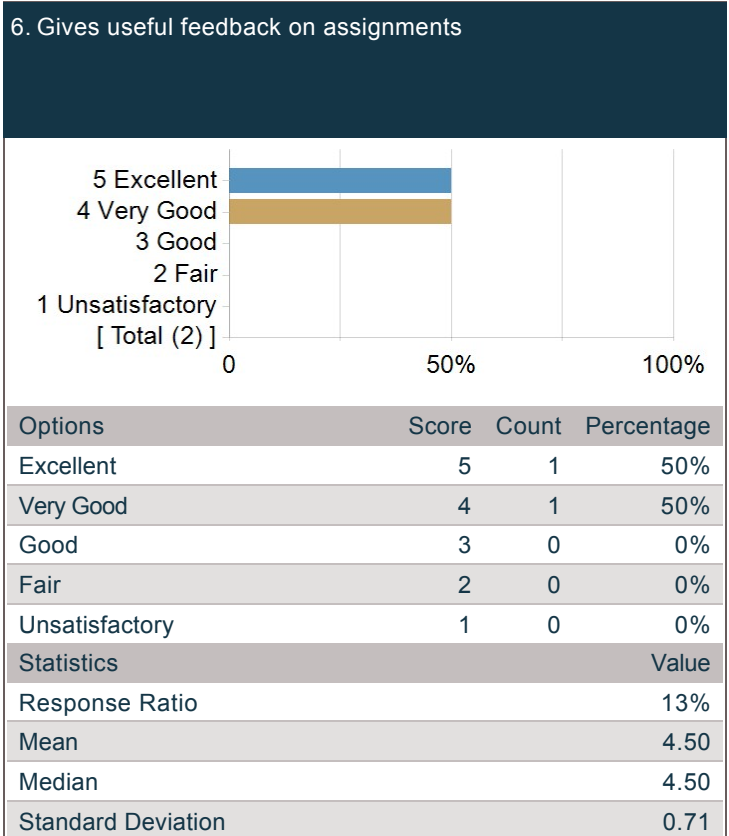
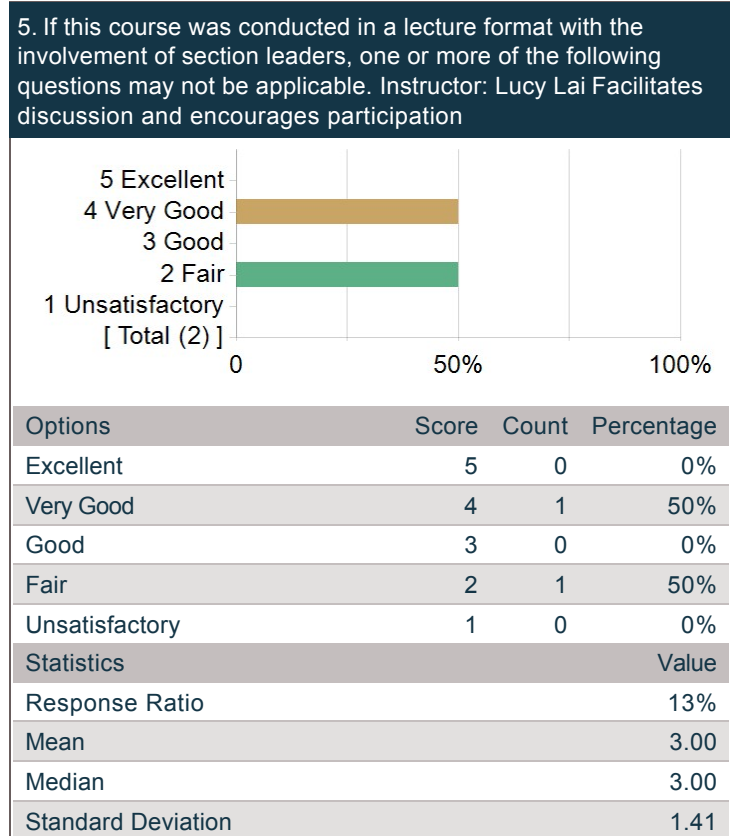
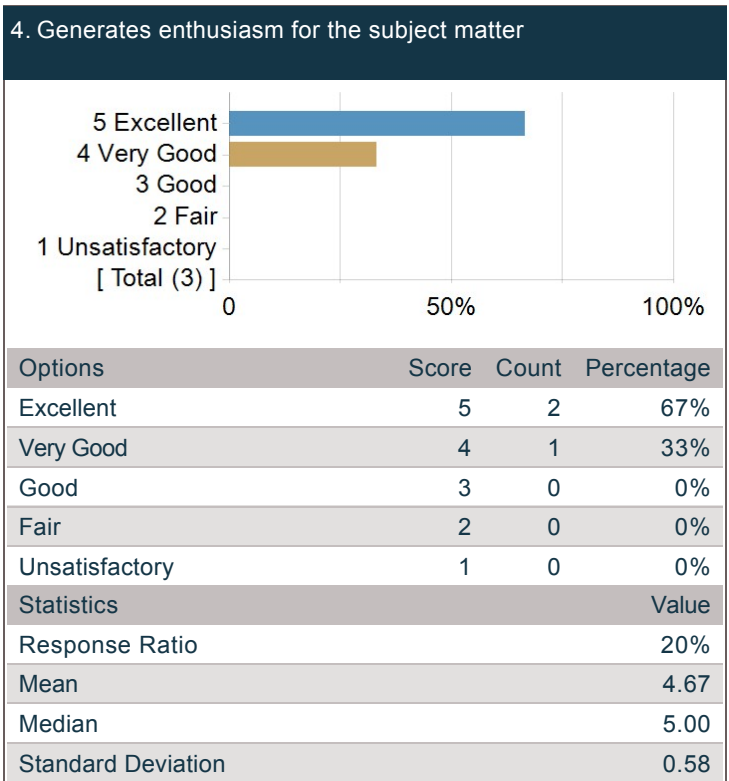
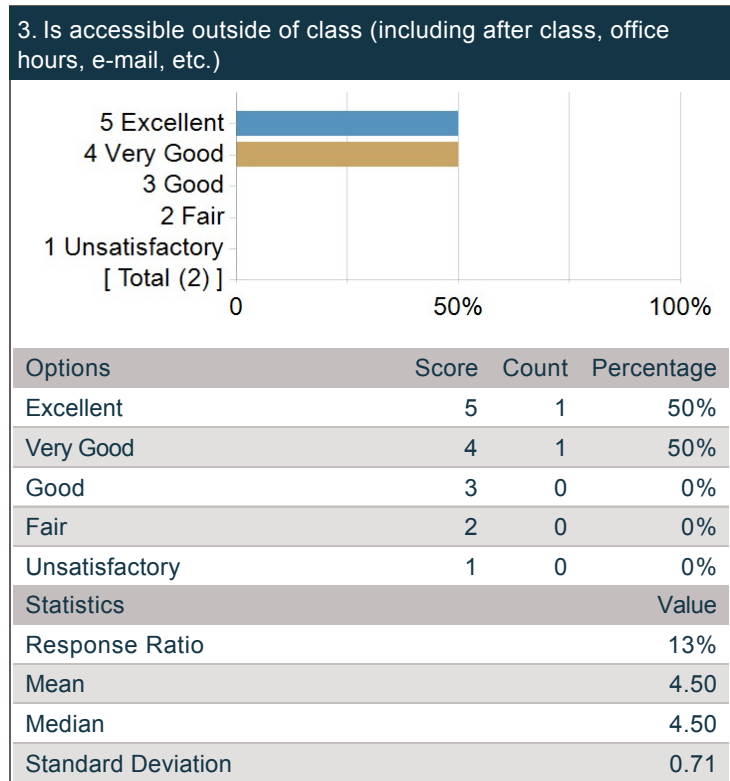
Evaluation of Instructors

General Instructor Questions

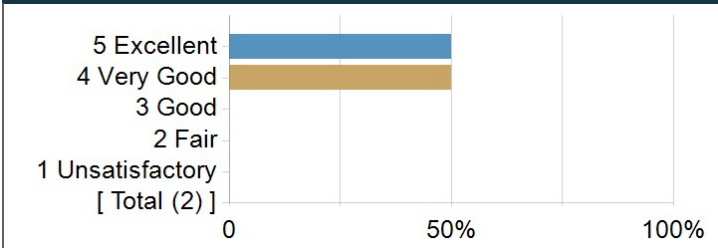
	Count	Excellent	Very Good	Good	Fair	Unsatisfactory	Instructor Mean	Dept Mean	Division Mean
Evaluate your Instructor overall.	3	67%	33%	0%	0%	0%	4.67	4.38	4.49
Gives effective lectures or presentations, if applicable	1	0%	100%	0%	0%	0%	4.00	4.33	4.36
Is accessible outside of class (including after class, office hours, e-mail, etc.)	2	50%	50%	0%	0%	0%	4.50	4.47	4.47
Generates enthusiasm for the subject matter	3	67%	33%	0%	0%	0%	4.67	4.43	4.51
If this course was conducted in a lecture format with the involvement of section leaders, one or more of the following questions may not be applicable. Instructor: Lucy Lai Facilitates discussion and encourages participation	2	0%	50%	0%	50%	0%	3.00	4.32	4.38
Gives useful feedback on assignments	2	50%	50%	0%	0%	0%	4.50	4.25	4.35
Returns assignments in a timely fashion	2	50%	50%	0%	0%	0%	4.50	4.31	4.35

Instructor

1. Evaluate your Instructor overall.				2. Gives effective lectures or presentations, if applicable			
Options	Score	Count	Percentage	Options	Score	Count	Percentage
Excellent	5	2	67%	Excellent	5	0	0%
Very Good	4	1	33%	Very Good	4	1	100%
Good	3	0	0%	Good	3	0	0%
Fair	2	0	0%	Fair	2	0	0%
Unsatisfactory	1	0	0%	Unsatisfactory	1	0	0%
Statistics			Value	Statistics			Value
Response Ratio			20%	Response Ratio			7%
Mean			4.67	Mean			4.00
Median			5.00	Median			4.00
Standard Deviation			0.58	Standard Deviation			N/A



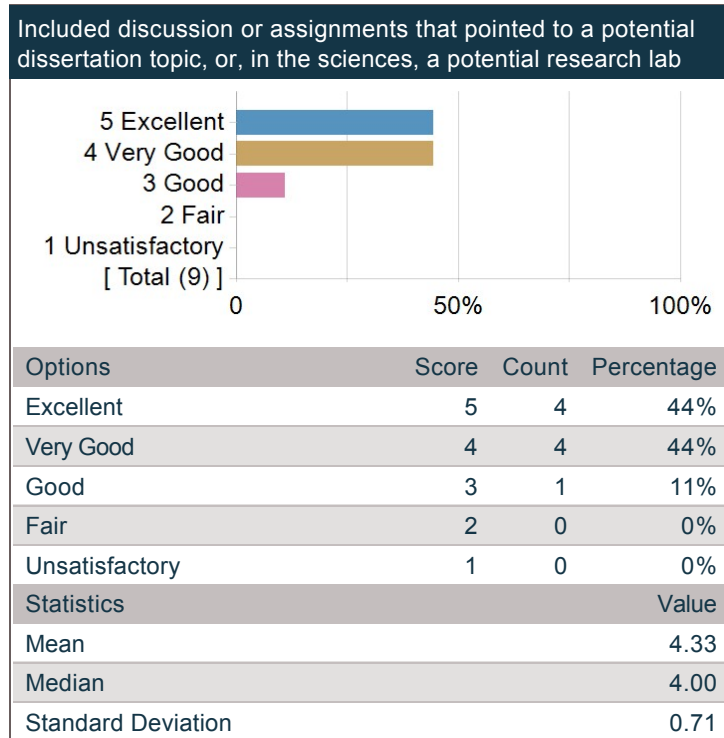
7. Returns assignments in a timely fashion



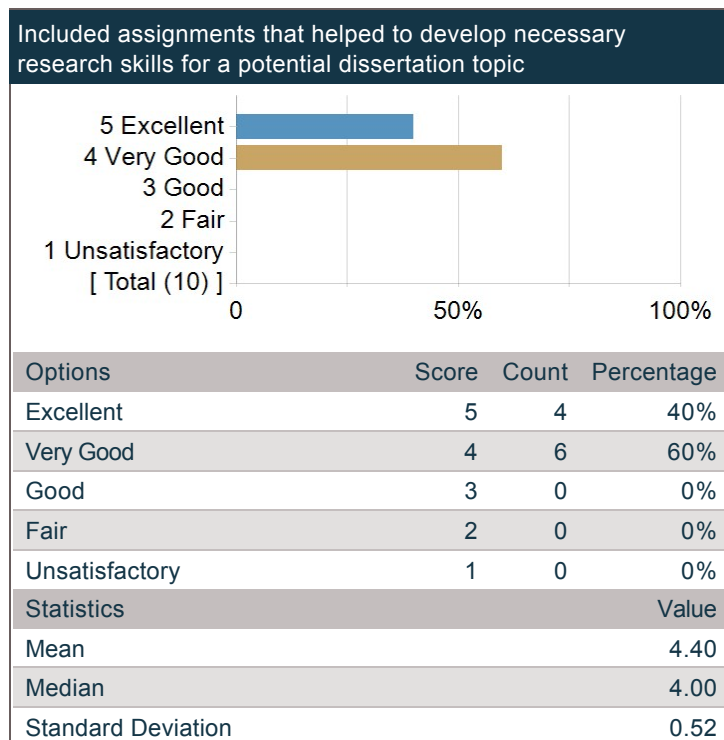
Options	Score	Count	Percentage
Excellent	5	1	50%
Very Good	4	1	50%
Good	3	0	0%
Fair	2	0	0%
Unsatisfactory	1	0	0%
Statistics	Value		
Response Ratio	13%		
Mean	4.50		
Median	4.50		
Standard Deviation	0.71		

GSAS Module Questions

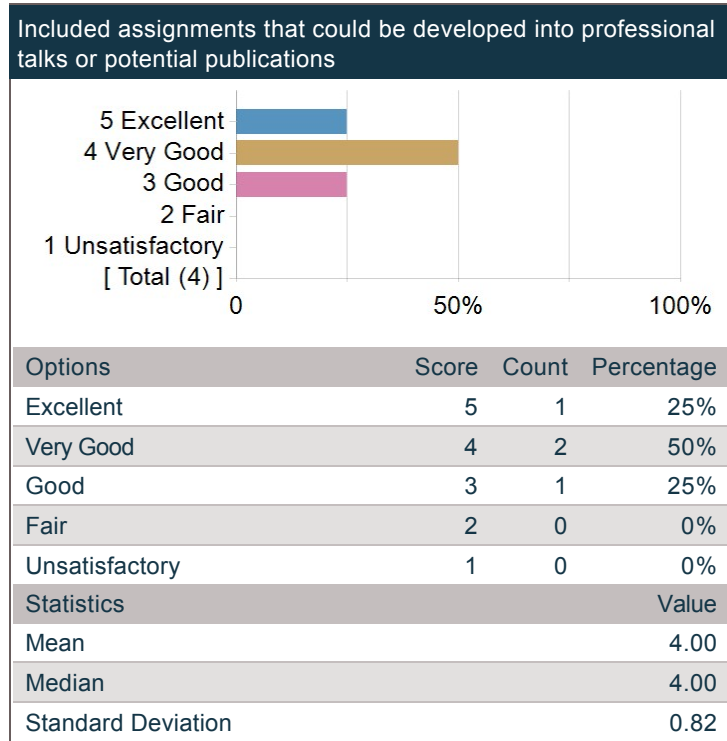
Included discussion or assignments that pointed to a potential dissertation topic, or, in the sciences, a potential research lab



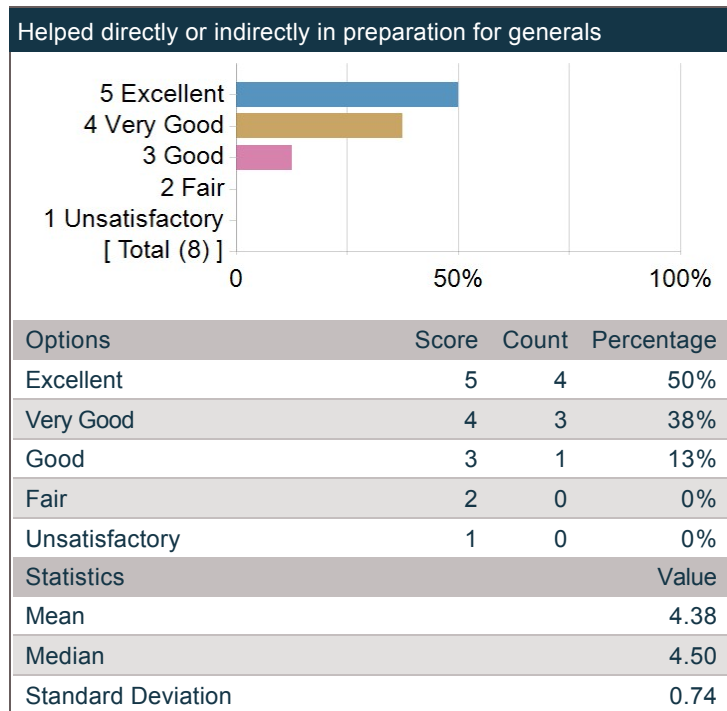
Included assignments that helped to develop necessary research skills for a potential dissertation topic



Included assignments that could be developed into professional talks or potential publications



Helped directly or indirectly in preparation for generals



Comment on aspects of the course as they relate to professional development, including preparation for future teaching.

Comments
Very helpful in developing a foundational understanding of computational toolsets that I can apply to my research/choose to further develop.
This course opened up avenues for incorporating a computational component into dissertation research & future work.
The tutorials, especially when they dealt with real neuroscientific data, were great in closing the gap between classroom and research lab



General Course Questions - Comments

What were the strengths of this course? Please be specific and use concrete examples where possible.

Comments
Tutorials were informative, instructive, and fun. Completing them in small groups cemented concepts and clarified misunderstandings efficiently.
Time-efficient, excellent lectures and notes, excellent tutorials / problem sets, helpful office hours & resources.
The videos are colab tutorials were really great for solidifying information
cover a lot of topics
This was an incredibly informative, effective course. The lectures were succinct, beautifully designed, and very useful in providing a foundation. The tutorials were incredibly well-composed and superbly reinforced the lecture material. The instructors were knowledgeable, friendly, and committed to teaching. I learned more in this class than I could have thought possible and am so grateful that it was offered. It has empowered me to go on to take more advanced computational neuroscience courses, and to begin to think about computational projects in my own lab work.
Meeting students where they were at in terms of course load. Finding resources to explain material intuitively
The course provides a very nice introduction to linear algebra, statistics and machine learning. The pre-recorded videos have a good balance of detail and general scope. The tutorials are designed at the level for helping to understand the concept better.
There are many strengths of this course. First off, the lecturer is great and very dedicated to our understanding. Ella prepared tailored videos to cover lots of ground in this course, and then designed accordingly coding tutorials that greatly reinforced the main concepts and applied them to real problems in neuroscience. The ground covered is vast. Therefore, the strength of this course is to provide a comprehensive overview of many tools and concepts one will probably encounter in his/her research. It is great both as a review course, or as an introductory course. Furthermore, it is awesome that the course has tutorials for every topic, and that these tutorials are done in Python, a language less used in neurobiology, but heavily dominant in non-bio or computational sciences. Finally, the applications with real data, or to real neuroscience problems is very attractive, and makes the transition from tutorials to own research work much easier.
In class tutorials + efficient use of time for background learning with pre-recorded videos

How could this course be improved? Please use concrete examples where possible and provide constructive suggestions.

Comments
This course would be greatly supplemented by a second semester that went further in–depth into each of the covered topics. This would provide students with a survey of these topics that they would typically not get from more focused courses, while building on the first semester's work to construct deeper understanding such as should be expected out of a graduate level education in these topics.
N/A
It was really great, I think it would have been helpful to have more videos for the machine learning section :)
it's hard to improve unless assume more time commitment
The only thing I can think of is that the course should be two semesters long, with an 'Advanced Math Tools' option in the spring! The instruction and teaching materials are so good that I would love to continue learning in this format.
Sometimes psets were a little too spoon–fed. It's a bit hypocritical to say that I appreciated that they didn't encroach on our outside of class time, but I do think the psets could have given us less without making us tear our hair out
There are very few things that can be improved. One thought I has was debating whether to have tutorials with an already coded skeleton for us to complete, or whether we should code the whole problem. The second is obviously more challenging and time–consuming, but perhaps it could be more insightful.
Would prefer all lecture learning offline, all in class time spent on application

Requirements Comments - What did this course require of you?

In your opinion, what preparation or background is necessary to take this course?

Comments
Linear algebra is super helpful, though not explicitly necessary. Differential equations is similar. I guess coding, particularly in python, is probably the most important skillset to have coming in.
Experience with python & computer science
Depend on how much you want to absorb. Need some applied math background
Some coding experience (I was fine with minimal background in Python) + calculus
Basically none. I think I got more out of it because I had a decent background, so the course was like a vaccine booster shot (topical) more than it was my first exposure, which I think was a benefit for me.
None really. I put easy because I had already covered all the topics. But this was a great revision, nevertheless.
Surprisingly little formal math training – the courseload and content are such that you can compensate on a week–by–week basis as necessary for any knowledge gaps.

Recommendations Comments - Would you recommend this course?

What did you take away from your experience in this course? What did you learn? How did this course change you?

Comments
<p>That Ella is an awesome instructor? That's the short answer. The list of things I learned during this course, or understand better now but "knew" before, is quite lengthy. It would save you time if you just refer to the syllabus. This course cemented the foundations of computational tools important to the field of systems and computational neuroscience, and drew connections and contrasts between the different approaches. I cannot recommend it highly enough.</p>
<p>I learned so much about computational neuroscience, a field I knew nothing about prior to the class. This course was a great introduction and I am now considering incorporating computational neuroscience research into my thesis work.</p>
<p>push me to think whether to dive in more deeply in comp neuron</p>
<p>This course was fantastic and I would highly recommend it to anyone interested in diving into computational neuroscience. It provides a strong foundation in the key concepts underlying computational approaches, essentially from scratch, and I am leaving the course feeling very much empowered to take more advanced courses and begin to incorporate computational work into my own research.</p>
<p>If I were to pick one topic, I would say encoding/decoding. In fact, that gave me the courage to start my first rotation, on decoding human neurophysiological data. So thanks for that! Also...the determinant of a matrix is the scaling factor of the geometrical transform the matrix is doing (?!?) How did I not get that in my first algebra course. Wow. Loved the geometric interpretation of linear algebra. Loved the ML part as well. And the genome sequencing exercise was great, always wondered how that happened. Finally, the primer on Pytorch confirmed that I do need an object oriented programming course, so I am looking forward to Ella's python course in the J term!</p>
<p>In general, this course has emboldened me to tackle computational questions for which I do not know the methods.</p>