

Title: **Spring 2018 COMS Final Evaluation**

Dates: **04/23/2018 - 05/03/2018**

Course: **COMSW4118\_001\_2018\_1/OPERATING SYSTEMS I**

Responses: **31/72 - 43.06%**

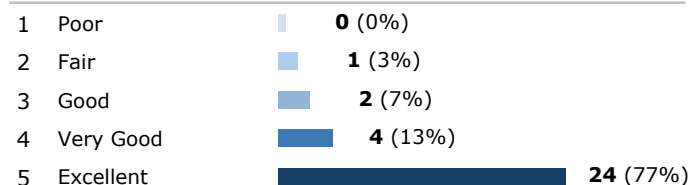
Instructors: **Jae W Lee**

Number of Participants: **72**

Enrollment of All Students: **72**

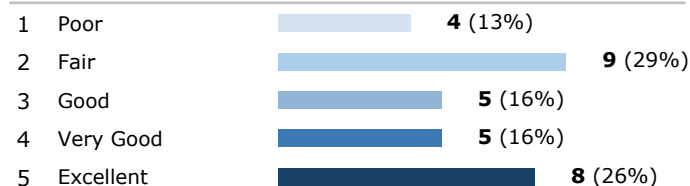
## Graph Course Questions

### 1 Course: Amount Learned N=31



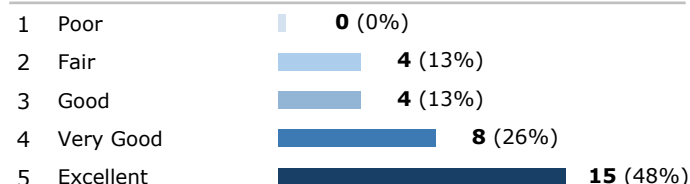
Median **5** Interpolated Median **4.85** Mean **4.65** Std Dev **0.75**

### 2 Course: Appropriateness of Workload N=31



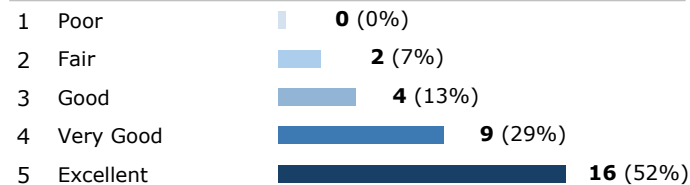
Median **3** Interpolated Median **3.00** Mean **3.13** Std Dev **1.43**

### 3 Course: Fairness of Grading Process N=31



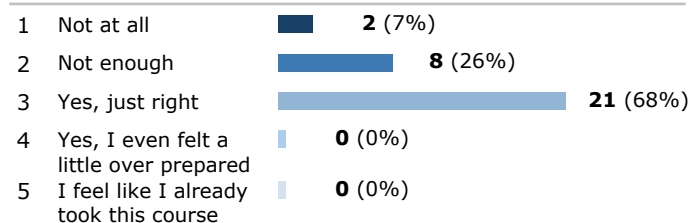
Median **4** Interpolated Median **4.44** Mean **4.10** Std Dev **1.08**

### 4 Course: Overall Quality N=31



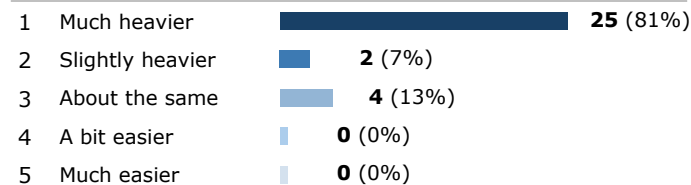
Median **5** Interpolated Median **4.53** Mean **4.26** Std Dev **0.93**

### 5 Do you feel that the pre-requisites for this course adequately prepared you for the course? N=31



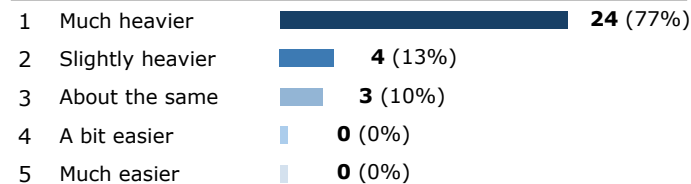
Median **3** Interpolated Median **2.76** Mean **2.61** Std Dev **0.62**

### 6 How did the workload of this course compare to that of other courses you've taken n Computer Science? N=31



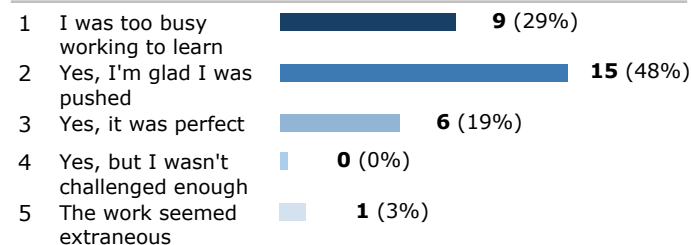
Median **1** Interpolated Median **1.12** Mean **1.32** Std Dev **0.70**

### 7 How did the workload of this course compare to that of other courses you've taken in other departments? N=31



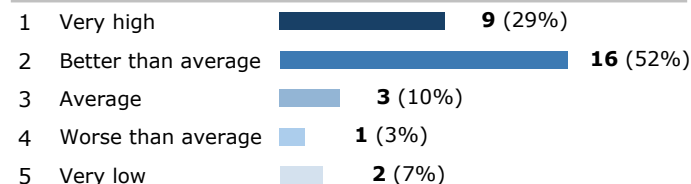
Median **1** Interpolated Median **1.15** Mean **1.32** Std Dev **0.65**

### 8 Do you feel that the workload of this course helped you learn the material well? N=31



Median **2** Interpolated Median **1.93** Mean **2.00** Std Dev **0.89**

### 9 Of all the CS courses you have taken, how does this course rank? N=31



Median **2** Interpolated Median **1.91** Mean **2.06** Std Dev **1.06**

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Comments Course Questions

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**Q1 Enter any additional comments here**

- Indeed, like Professor Jae said in the last class, this course trains me not to be afraid of reading millions of lines of code. I think that is an important quality of a good programmer.
- Jae makes it easy to learn and to love systems. His assignments perfectly implement the theory he describes during lecture, while still putting the work on the students to read source code, learn to debug in kernel space, manage memory efficiently, etc...Make no mistake, you will work hard, but you will learn a level of programming so low and so close to the hardware that at the end you'll have such an appreciation of high level programming abstraction....you don't truly know what objects are until you spend a year dealing with structs and pointers. OS is a natural contain of AP, and Jae makes that connection smooth, but working ahead and having an efficient workflow is important. Learn that as early as you can (especially for the group assignments- 5 out of 8 of the homework assignments are group projects, and they are massive). By the end of the semester, you'll have mastered the kernel development process, and you'll seriously enjoy doing the assignments (even his tests are fun, albeit challenging).

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## - Pros:

- \* The skills you gain from navigating a massive code base are probably more valuable and will translate better than any skill you that you pick up in any class.
- \* The class covers a wide range of topics, all of which feel very relevant toward the ultimate goal of a CS/CE degree: Understanding how computers work and how we as programmers can utilize them in an optimal fashion to create beautiful solutions.
- \* The TA's are all brilliant.
- \* Jae cares about making the class better. This dynamic is not guaranteed in all professor-course relationships.
- \* I hate group projects with a passion (as everyone should), but I'll even put it as a pro here because it forces you to perform project management/interact with other people, the latter of which is satanic by nature but relatively necessary in life. We can complain all we want about how inevitably group projects go to you-know-what, but it forces people to either get really good at over-the-shoulder programming if you like being in the same room as your teammates or do a great job of intelligently dividing tasks up in a modular way that allows for concurrent, independent code writing if you're like me and would place thinking/coding while interacting with another human being next to lounging around in a pit with NYC subway rats on a scale of personal enjoyment.

## Cons:

- \* The class is 3 credits. This is more confounding than any OS concept. Everyone in the CS department knows that OS is a class that you avoid taking unless you have a real light semester. Heaven forbid you're taking 16-18 credits (a very reasonable credit load for a given semester) and you really want to get the most out of the class. It's sad because this is such an incredibly worthwhile class that will force students to improve ten-fold as programmers and thinkers IF they dedicate a massive amount of time to doing the readings, doing the additional readings for the assignments, really taking time to understand the Linux Kernel code that they need to utilize, taking time to make sure they are writing beautiful, modular code, and then supporting their solution code with well-thought out test code. I would love to know how many students were able to do all this with under 15 - ish hours of effort a week. Let's start to reward students for taking hard courses that force them to truly develop by being honest about the time commitment that is required to experience optimal growth through the course and then adjust the credit value of the course appropriately.
- \* The exams weight vs. assignment weight seemed way off. Especially in this class, where the real learning occurs during the assignments, not when you re-read a couple of textbook pages. I'd advise you to do away with exams entirely and replace them with 1 additional assignment - you'd probably see a tenfold increase in knowledge gained by students.
- \* Can we just get rid of the lectures, too please? This isn't 1885, we now are pretty positive that having someone talk about operating systems in front of a lecture hall for 75 minutes while 96% of those students in attendance doze off and look at whatever crap is on their Facebook feed is the least optimal way in the

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universe for people to learn. Especially OS, where concepts can be dense and difficult to visualize. I get that this basically requires a massive course redesign and there's no incentive for professors to want to do this, but if you really want your students to be stud learners...

- Jae's approach to teaching is much more successful in AP than in OS. This course was honestly a logistical mess, advice for the future:

1) Understand that the sequencing of the latter half of the course, all but prevented people from changing what group they were in. There was no chance, for example, for someone whos group didnt pull their weight to switch when before assignments were even due, other assignments were being released.

2) Dont give exams where the grading rubric is purely nonsensical. What was the point of docking 7pts out of 12pts on exam 1 for missing a "(char \*)" cast, that wouldn't have received 7pts of 12 had that been provided as an answer on its own? (Im referring to the expansion of the container\_of macro)

3) Be a little more clear upfront about the sequencing and relative difficulty of the assignments, anyone who completed hw1-4 perfectly would still be severely under-prepared for say, 6-8 which where objectively substantially more work in substantially less time. I did not know April was gunna be so rough.

4) Honestly, while I appreciate that not everything can be spoon-fed to students, particularly not on the graduate level, Im pretty stunned at how often I found myself learning the details of everything on my own. OSCE is a horrible text which isnt at all any more detailed than the lecture material, which is, understandably limited by time constraints. LKD and APUE are much better but dense and hard to approach given the level of understanding one receives from class or OSCE. Although there are plenty of details that are worthwhile to figure out on your own, not everything has to be a trial by fire. Sometimes, if you help people along to an answer (and I mean \*help\*, not force them under time constraints to come up with one) they'll remember things just as well.

- I love Jee's class. Even though the course was so tough, I wouldn't learn so much without it.
- This class was LOTS of work but it's pretty gratifying to actually write a scheduler/filesystem/system call/multi-threaded server and see it in action.

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- My main criticism of this course is the lecture was very poor preparation for the homework. Lecture was about the high level OS concepts. The homework was about Linux Kernel development. The homeworks often required reading 1000s of lines of kernel code. Kernel code is not very readable and usually does not have a lot of documentation, so this was difficult. In lecture there is very little mention of specific core functions that would have been very helpful during the homework. In fact, we found online older slides from a different Columbia professor, which had a wealth of information regarding the way specific kernel functions worked what the API was meant to be. Jae clearly adapted these slides to make his own, but removed all mention of specific kernel functions. Also, We were not taught debugging strategies, and had to discover them on our own, often too late.
- The Workload was extensive. I feel like there should have been more guidance especially with the scheduler homework. There were a lot of details that you had to do extensive research on to get it done with such a short deadline. I also did not enjoy being told we have two weeks after spring break to finish an assignment and then come back and have it immediately changed to 1 week.

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- Sure this critique is assuming the person took AP with Jae. I will use Labs as the way to critique it.  
HW #1: Good introduction to Operating Systems, especially since it seemed fresh from AP  
HW #2: It was tough at first but doable after reading the kernel. Nothing too extreme  
HW #3: It is neat to make this an extension of Lab 7 from AP. The goal was clear. There could have been more hints on things to be careful of. But, it was doable, especially if fresh from AP.  
HW #4: I wasn't able to get the system call to work. Even though the TAs troubleshooted it. But whatever, at least now I have a guide to make a new system call.  
HW #5: Ok a hashmap in the kernel, sure the class never did serious kernel programming, but at least we know what a hash map is, etc. So it wasn't too bad.  
HW #6: ugh, I wish there was more instructions on the scheduler entity, then I would have done better.  
HW #7: doable since there was a lot of information given  
HW #8: It was relatively easy, but ONLY once every piece of data came together.

## Main flaws:

- 1- Too little guidance, especially toward the end (HW #6 and HW #8). This wasn't fatal in the start (HW #1 - 5) because with AP past knowledge is there. But file systems and schedulers is too new to base on experience.
  - 2- I think the course should use Ubuntu instead of Arch Linux. Ubuntu is easy to install, and there seems to be no real gain since both of them use the same kernel.
  - 3- This course really departed from AP in terms of using resources. In AP, Jae is more than happy to fail you if you even have a sniff of extra help. But here, we are told to Google stuff and use existing kernel code? I mean, just use Nieh's rule then. If there is code that looks too similar, if the person cites it, then it is permitted. Plain and simple, easy, no questions asked.
  - 4- I literally did most of the work in my group and that was fucking horrible. Especially since that won't be accounted in my grade. Now sadly it is hard to measure impact of group members.  
But what can be done (It is done in Software Engineering), track the number of commits and code added. Make it a rule that all teammates must distribute commit number and code. if one person gets more shit done, they should be given a higher grade or something to account for the extra work put in. Carrying my team really fucked over my semester.
- This class was a lot of work, but I learned a lot from doing it. I was frustrating that I had to teach so much of the material to myself outside of class though.

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- Professor Jae's page table explanation, and in general some of the material in the second semester, was presented in a confusing/slightly unengaging way. Sometimes, I would actively choose in lecture to stop paying attention and learn from the book/web resources. (In the first Advanced UNIX programming part, I was more engaged and primarily learned from lecture.) Sometimes the homework requirements were not clear, even though I liked all the kernel hacking assignments later. At multiple points in doing the assignments, I didn't know what I was neglecting to consider and what I was overthinking, and felt like I was guessing at what was necessary. Maybe this is part of the challenge, but I felt like me guessing was not very productive.
  - I cannot believe you gave into the PC snowflakes and moved the exam— that was ridiculous
  - As a non-CS major student, the first half of the course (about user's perspective to kernel) is the most helpful, which I believe also is the case for many CS major students. The kernel hacking part of the course is a bit overtly specific to the programming details and sometimes is hard to grasp (the concept is not delivered very clearly in class and we are required to complete an assignment down to every detail. This is partially due to the complex nature of kernel programming as well). I suggest focusing more on the first part of the course in future offerings. Overall, Jae did a wonderful job! I do believe I have more or less learned to handle the most daunting part of CS programming, which gives me confidence to handle other CS tasks in days to come.
  - Would be better if you do not be late for class
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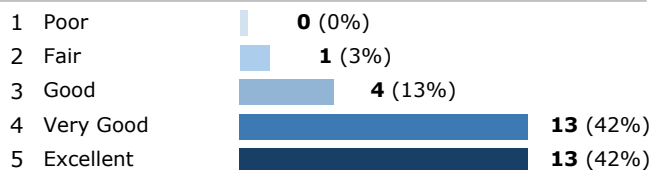
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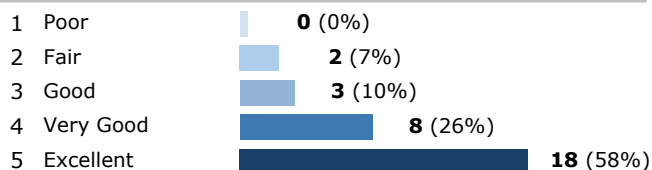
Instructor Graph Report for: **Jae W Lee**

## 1 Instructor: Organization and Preparation N=31



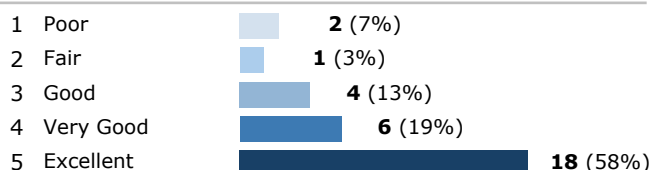
Median **4** Interpolated Median **4.31** Mean **4.23** Std Dev **0.80**

## 2 Instructor: Classroom Delivery N=31



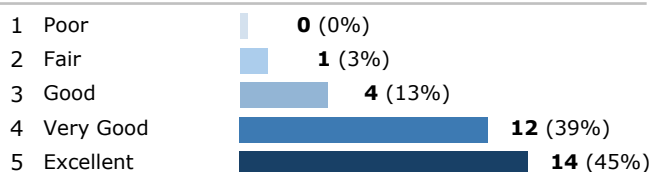
Median **5** Interpolated Median **4.64** Mean **4.35** Std Dev **0.91**

## 3 Instructor: Approachability N=31



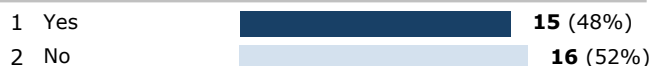
Median **5** Interpolated Median **4.64** Mean **4.19** Std Dev **1.19**

## 4 Instructor: Overall Quality N=31



Median **4** Interpolated Median **4.38** Mean **4.26** Std Dev **0.82**

## 5 Would you nominate this professor for the SEAS Distinguished Faculty Award? N=31



Median **2** Interpolated Median **1.53**



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- Jae teaches the best CS fundamental classes. Though I do think he teaches AP better than OS, he deserves a distinguished teaching award.
- clear lecturer, cares about class and notes
- Jae makes it easy to learn and to love computer systems. After taking a full year of class with him (AP and OS), I can say that I have a love for computer systems. His assignments perfectly implement the theory he describes during lecture. His lectures are always great, with diagrams on the chalk board, slides, and him actually testing some code on screen for the class to see. He gives information pertinent to the homework beforehand, but makes sure to ween us off of it towards the end to make sure we really know the material. His assignments teach students how to use git/GitHub to manage group workflow, preparing them for work in the industry. Jae manages a hard working, talented team of TAs that grade homework/exams quickly and answer questions on the class listserv promptly. A wonderful spirit and a terrific educator!
- Jae explains concepts well and the course is well structured.
- Really considerate and nice! learned a lot in this class!
- The course content is carefully chosen and the homework is well-designed. Really helpful in understanding the basis of the computer science. My favorite teacher this year.
- Puts a lot of thought into the course road map and genuinely cares about student progression/learning. Cannot really comment on him as a lecturer, as I did not attend a single lecture.
- Not only he equipped so much knowledge, but he knows how to teach and catches student's attention.
- Great professor! Very approachable, lectures are clear, and assignments are challenging but well designed.

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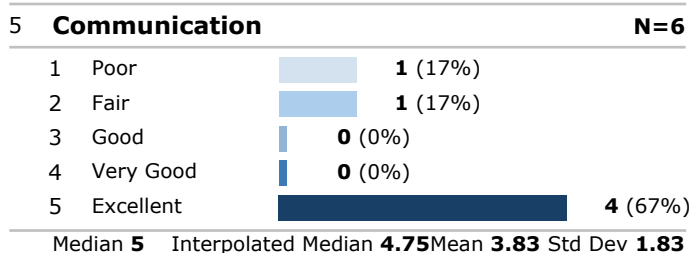
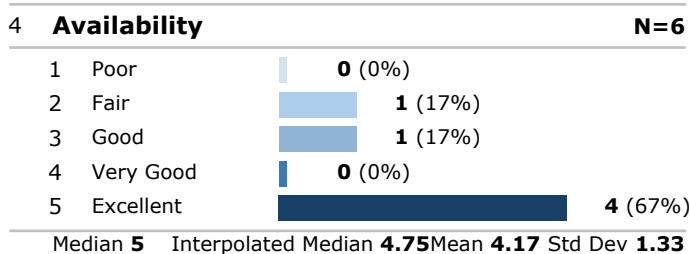
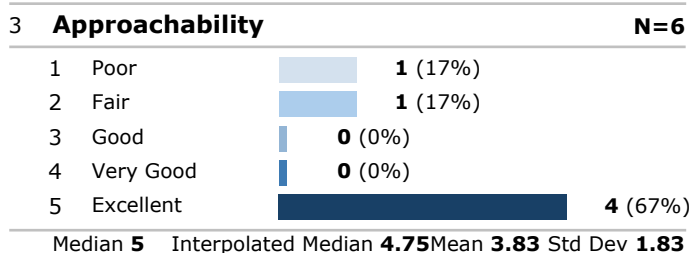
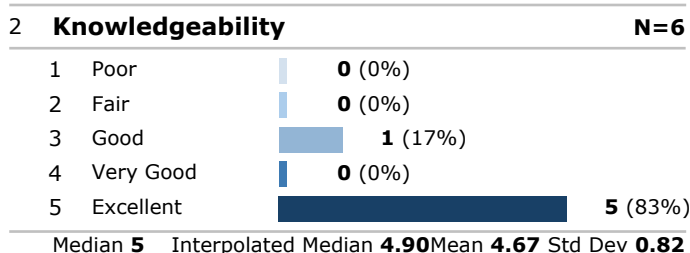
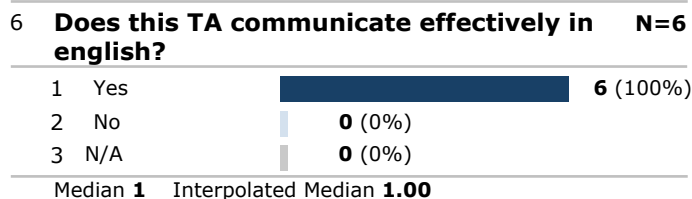
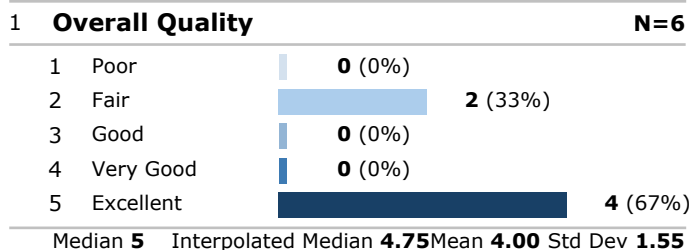
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TA Graph Report for: **Howon Byun**



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TA Comments Report for: **Howon Byun**

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### Q1 **Comments**

- Great TA and very helpful and patient with explaining things.
  - Just not willing to communicate, he'd rather play mobile phone
  - Very knowledgeable!
  - Excellent kernel development workflow guides (vim tips were great), helpful listserv responses.
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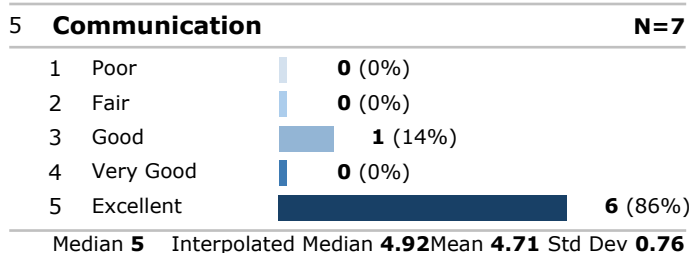
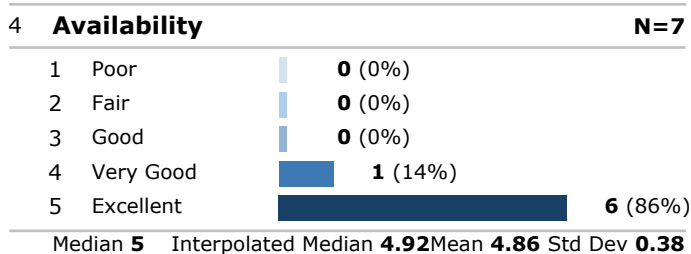
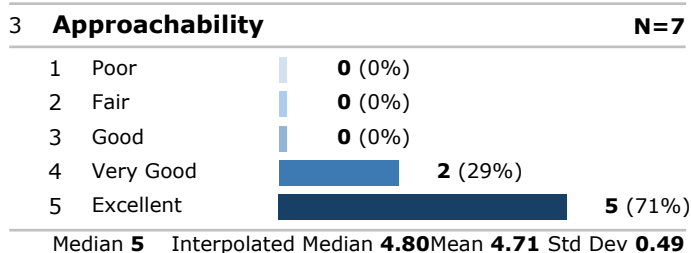
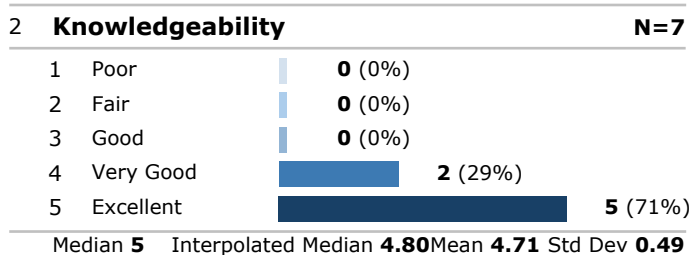
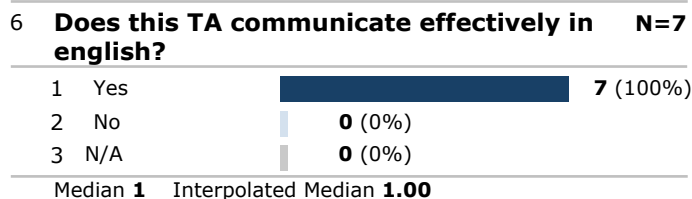
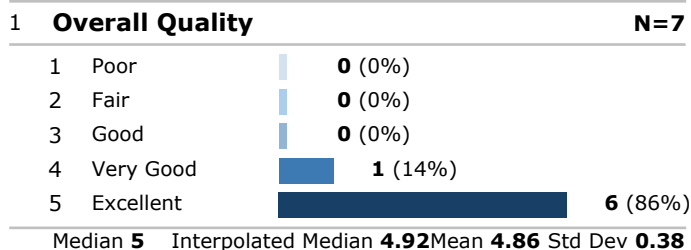
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TA Graph Report for: **JiaYan Hu**



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TA Comments Report for: **JiaYan Hu**

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### **Q1 Comments**

- If the course records the video of the lectures, it will help us a lot for study.  
Professor should show more rubrics in the homework requirement.  
The exams should be more easy to be fair. Now most of the students only answered half of the problems.
  - Very helpful!
  - Jiayan sometimes stayed longer than her office hours which was really helpful & nice of her.
  - Jiayan is great! She is able to explain confusing things in a couple of sentences without giving away answers. I appreciate this part of her so much. She is also very responsive and nice.
  - Super helpful/approachable/knowledgeable!
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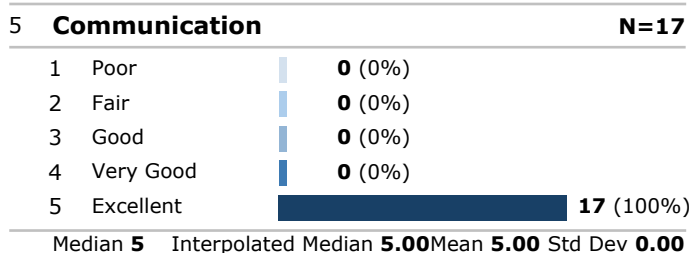
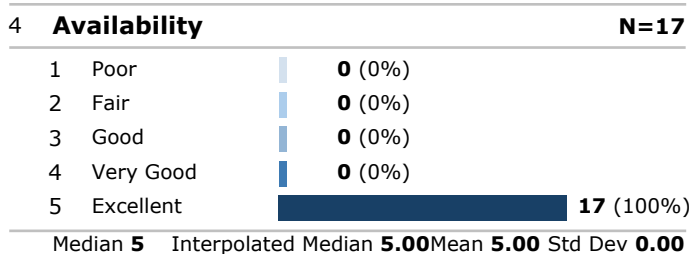
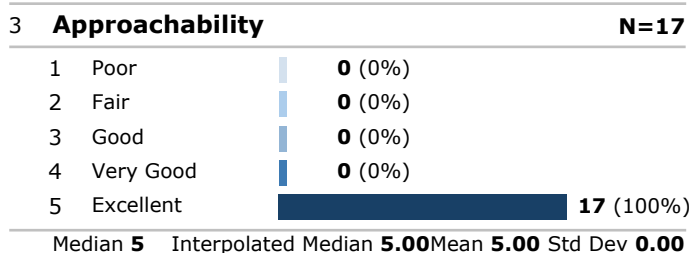
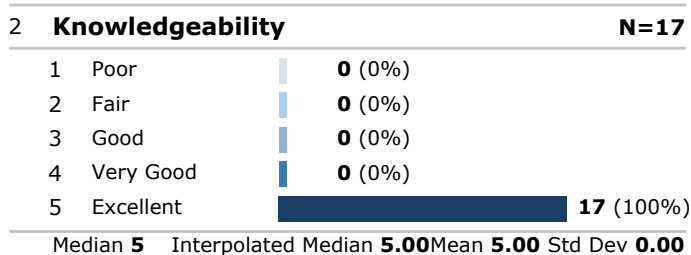
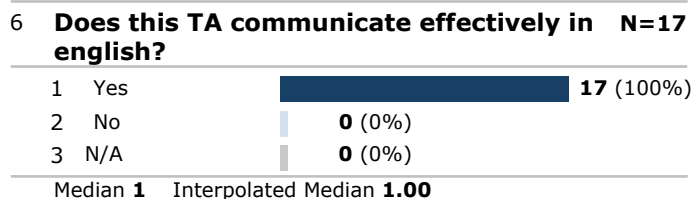
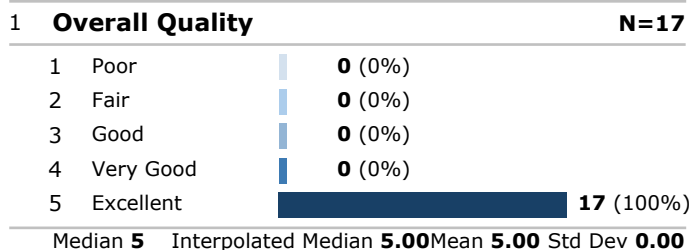
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TA Graph Report for: **John Zhuang Hui**



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Responses: **31/72 - 43.06%**

Instructors: **Jae W Lee**

Enrollment of Registered Students:**72**

Enrollment of All Students:**72**

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TA Comments Report for: **John Zhuang Hui**

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### **Q1 Comments**

- John is super helpful in debugging our messy code! More importantly, he is knowledgeable and very responsive.
  - Incredibly competent and knowledgeable and friendly. Great TA!
  - An unbelievable TA. John answers listserv emails (and with helpful information), is amazingly knowledgeable about OS/Linux. he even updated all the assignments for Linux kernel version 4.9.81. Super approachable.
  - Very helpful, active on listserv, knowledgeable, good approach.
  - The GOAT.
  - Great!
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Title: **Spring 2018 COMS Final Evaluation**

Dates: **04/23/2018 - 05/03/2018**

Course: **COMSW4118\_001\_2018\_1 / OPERATING SYSTEMS I**

Responses: **31/72 - 43.06%**

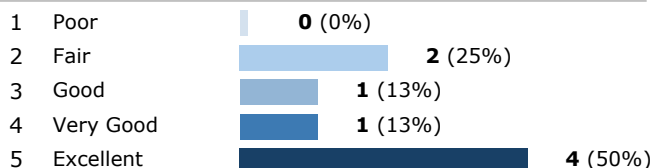
Instructors: **Jae W Lee**

Number of Participants: **72**

Enrollment of All Students: **72**

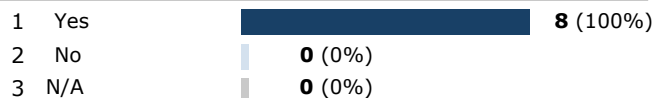
TA Graph Report for: **Kundan Guha**

## 1 Overall Quality N=8



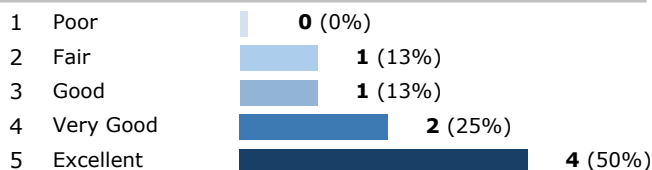
Median **4.5** Interpolated Median **4.50** Mean **3.88** Std Dev **1.36**

## 6 Does this TA communicate effectively in english? N=8



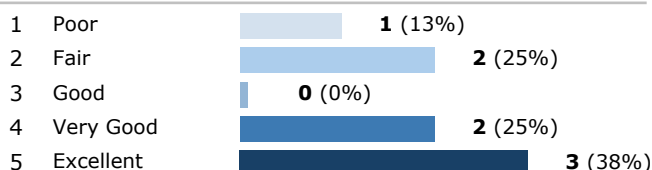
Median **1** Interpolated Median **1.00**

## 2 Knowledgeability N=8



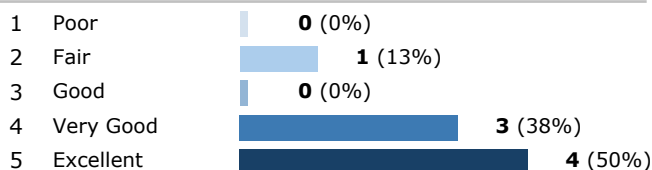
Median **4.5** Interpolated Median **4.50** Mean **4.13** Std Dev **1.13**

## 3 Approachability N=8



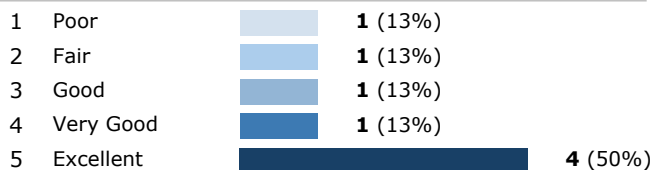
Median **4** Interpolated Median **4.00** Mean **3.50** Std Dev **1.60**

## 4 Availability N=8



Median **4.5** Interpolated Median **4.50** Mean **4.25** Std Dev **1.04**

## 5 Communication N=8



Median **4.5** Interpolated Median **4.50** Mean **3.75** Std Dev **1.58**



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TA Comments Report for: **Kundan Guha**

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### **Q1 Comments**

- Memorable quote: "If it works, it works."
  - Very approachable, knowledgeable and sincere.
  - Great help on the class listserv
  - often offered unhelpful comments, less clear in explanations
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Course: **COMSW4118\_001\_2018\_1 / OPERATING SYSTEMS I**

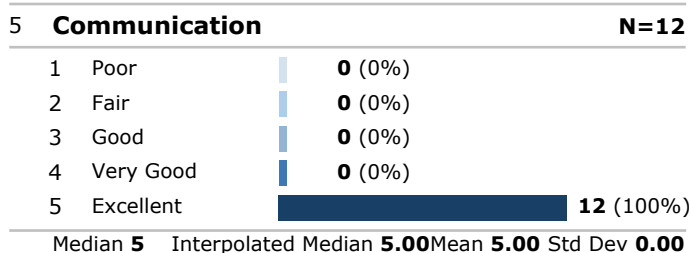
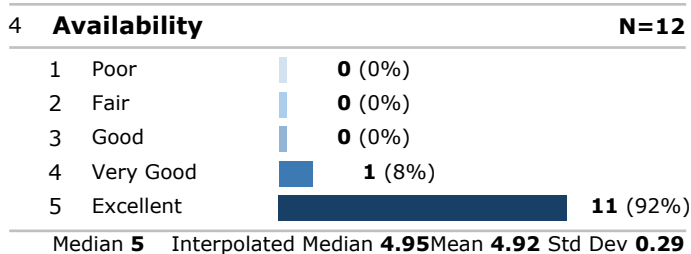
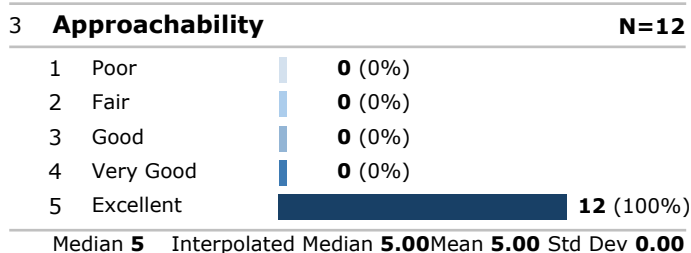
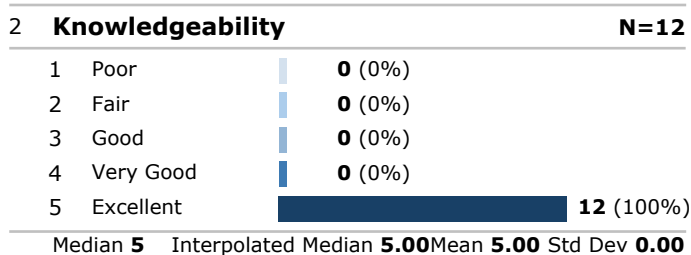
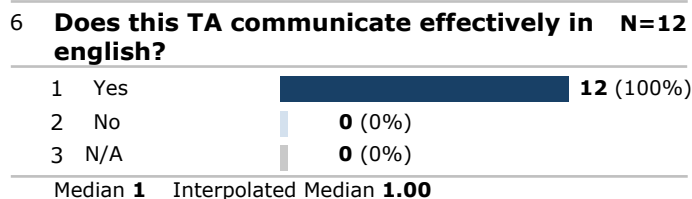
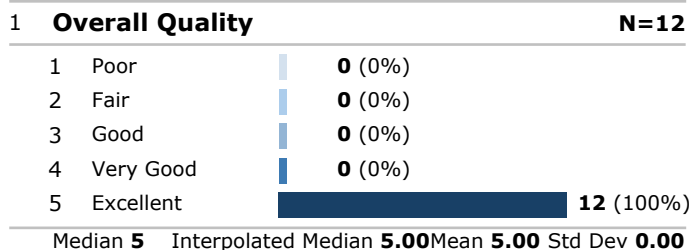
Responses: **31/72 - 43.06%**

Instructors: **Jae W Lee**

Number of Participants: **72**

Enrollment of All Students: **72**

TA Graph Report for: **Mert Ussakli**



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Title: **Spring 2018 COMS Final Evaluation**Dates: **04/23/2018 - 05/03/2018**Course: **COMSW4118\_001\_2018\_1 / OPERATING SYSTEMS I**Responses: **31/72 - 43.06%**Instructors: **Jae W Lee**Enrollment of Registered Students:**72**Enrollment of All Students:**72**

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TA Comments Report for: **Mert Ussakli**

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**Q1 Comments**

- Mert is so nice and so patient and he cares about if we understand things. If there is some confusion during OH, he would follow up with detailed and extended emails to make sure we have the correct information.
  - Very helpful!
  - Seems stern at first but is actually sincere and very helpful. Knows the material well and active on the listserv.
  - Savant
  - Very helpful in office hours and on the class listserv.
  - Great TA! Very helpful and dedicated and friendly.
  - Mert was a lifesaver. He explained the concepts well in homework assignments and made it actually doable to complete tasks on time. I especially admire his patience as a TA.
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