CSS 422 B
Hardware And Computer Organization
Course type: Face-to-Face

Taught by: Yusuf Pisan
Instructor Evaluated: Yusuf Pisan-Assoc T Prof

Evaluation Delivery: Online
Evaluation Form: A
Responses: 37/44 (84% very high)

Overall Summative Rating represents the combined responses of students to the four global summative items and is presented to provide an overall index of the class's quality:

Median	College Decile
3.6	**2**
(0=lowest; 5=highest)	(0=lowest; 9=highest)

Challenge and Engagement Index (CEI) combines student responses to several *IASystem* items relating to how academically challenging students found the course to be and how engaged they were:

CEI: 5.5
(1=lowest; 7=highest)

SUMMATIVE ITEMS

	N	Excellent (5)	Very Good (4)	Good (3)	Fair (2)	Poor (1)	Very Poor (0)	Median	DECILE RANK Inst	College
The course as a whole was:	37	19%	32%	41%	5%	3%		3.5	2	2
The course content was:	37	19%	32%	46%	3%			3.5	1	2
The instructor's contribution to the course was:	37	38%	27%	24%	8%		3%	4.0	2	3
The instructor's effectiveness in teaching the subject matter was:	37	22%	27%	30%	14%	8%		3.5	1	2

STUDENT ENGAGEMENT

Relative to other college courses you have taken:	N	Much Higher (7)	(6)	(5)	Average (4)	(3)	(2)	Much Lower (1)	Median	DECILE RANK Inst	College
Do you expect your grade in this course to be:	37		19%	16%	41%	16%	5%	3%	4.1	0	1
The intellectual challenge presented was:	37	38%	38%	19%	5%				6.2	8	8
The amount of effort you put into this course was:	37	35%	27%	27%	11%				6.0	6	6
The amount of effort to succeed in this course was:	37	35%	27%	30%	8%				6.0	6	6
Your involvement in course (doing assignments, attending classes, etc.) was:	37	32%	14%	30%	19%	3%	3%		5.4	2	2

On average, how many hours per week have you spent on this course, including attending classes, doing readings, reviewing notes, writing papers and any other course related work?

Class median: 9.7 Hours per credit: 1.9 (N=37)

Under 2	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22 or more
	3%	8%	19%	19%	16%	14%	11%	3%		8%	

From the total average hours above, how many do you consider were valuable in advancing your education?

Class median: 6.9 Hours per credit: 1.4 (N=37)

Under 2	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22 or more
3%	8%	22%	24%	11%	8%	14%	8%			3%	

What grade do you expect in this course?

Class median: 3.3 (N=37)

A (3.9-4.0)	A- (3.5-3.8)	B+ (3.2-3.4)	B (2.9-3.1)	B- (2.5-2.8)	C+ (2.2-2.4)	C (1.9-2.1)	C- (1.5-1.8)	D+ (1.2-1.4)	D (0.9-1.1)	D- (0.7-0.8)	E (0.0)	Pass	Credit	No Credit
5%	30%	35%	16%	8%	3%		3%							

In regard to your academic program, is this course best described as:

(N=37)

In your major	A core/distribution requirement	An elective	In your minor	A program requirement	Other
57%	38%			5%	

STANDARD FORMATIVE ITEMS

	N	Excellent (5)	Very Good (4)	Good (3)	Fair (2)	Poor (1)	Very Poor (0)	Median	DECILE RANK Inst	DECILE RANK College
Course organization was:	37	22%	38%	32%	3%	5%		3.8	2	3
Clarity of instructor's voice was:	37	22%	32%	30%	14%	3%		3.6	1	1
Explanations by instructor were:	37	22%	32%	27%	16%	3%		3.6	2	2
Instructor's ability to present alternative explanations when needed was:	37	19%	19%	43%	19%			3.2	1	1
Instructor's use of examples and illustrations was:	37	22%	27%	30%	19%	3%		3.5	1	1
Quality of questions or problems raised by the instructor was:	37	30%	30%	30%	8%	3%		3.8	2	2
Student confidence in instructor's knowledge was:	37	32%	35%	22%	11%			4.0	1	2
Instructor's enthusiasm was:	37	46%	38%	16%				4.4	2	3
Encouragement given students to express themselves was:	37	35%	38%	27%				4.1	2	3
Answers to student questions were:	37	30%	32%	30%	8%			3.9	2	2
Availability of extra help when needed was:	37	38%	30%	27%	3%	3%		4.1	2	3
Use of class time was:	37	43%	22%	24%	8%	3%		4.2	4	4
Instructor's interest in whether students learned was:	37	32%	41%	19%	5%	3%		4.1	2	3
Amount you learned in the course was:	37	27%	41%	22%	11%			3.9	2	3
Relevance and usefulness of course content were:	37	27%	38%	27%	8%			3.9	2	2
Evaluative and grading techniques (tests, papers, projects, etc.) were:	37	32%	41%	19%	5%	3%		4.1	3	4
Reasonableness of assigned work was:	37	38%	22%	32%	5%	3%		3.9	2	3
Clarity of student responsibilities and requirements was:	37	27%	38%	30%	5%			3.9	2	2

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STANDARD OPEN-ENDED QUESTIONS

Was this class intellectually stimulating? Did it stretch your thinking? Why or why not?

1. This class did require thinking and the concepts were more advanced than the previous classes taken in the CSSE major.

2. It was intellectually stimulating as the content covered was very difficult and interesting.

3. yes It was stimulating one of the most stimulating classes I took because it taught actual useful things that expand my knowledge of how computers work and have testable results

5. Yes, I enjoyed it. There could have been better understanding to help.

6. Yes, it introduced a lot of new topics that I previously hadn't gone over in other classes. In this way, it required me to stretch my thinking.

7. It was, there were many challenging exercises

8. The new concept of hardware topics such as circuits, arm architecture, and instruction sets made me think about how to do things differently. These new concepts made me figure how to think at a lower level and with different environments

9. The content of the class was very stimulating, but the method it was taught was not. We learned about stuff like Karnaugh tables and how to use thumb2 ARM assembly, which was very interesting. The presentations and lectures were pretty dull though, not much energy was provided by the professor.

10. Yes, it provided new ideas that required new perspectives and thought techniques.

11. Very much so

12. Yes, the class was intellectually stimulating. It did stretch my thinking, forcing me to dive deep into the organization of the bus, circuits, and arm assembly. All fairly new concepts that were pretty difficult to learn.

13. Yes, I learnt hardware ARM language and how to use the three new coding and drawing applications which are very useful. Also I learnt the logical gates and memory implementing. I think I stretch my thinking in hardware area.

14. The class was very interesting and taught me a lot about computer hardware.

15. Yes, this class was intellectually stimulating and did stretch my thinking. Most of what was taught in this course I did not know, so there were times when I needed to do some extra research outside of class.

16. This class really made me think hard about the concepts and I had to think differently than I am used to.

17. Yes, it was intellectually stimulating because everything that was taught in this class was new to me. It also did stretch my thinking because I had to learn a new programming language (Assembly) and then I had to use the language to complete homework assignments which was a little difficult, since I had to think of a way to solve the problem with that language.

18. Yes. Learned assembly.

19. Yes it was intellectually stimulating, was a hard class with problems that were good.

20. There was a large amount of content covered and the second half of the quarter in particular was different from anything I'd done before. So yes the class was intellectually stimulating.

21. honestly no, the content is quite straightforward and not needed especially in the direction of where the field of computer science is going. Regarding arm assembly it is almost irrelevant in todays computer science industry and is learning it as well as the tools such as keil microvision are unnecessarily difficult. Students are better off challenging their minds as concepts that are more forward and not regressing towards usage of assembly.

22. I really don't like the content of this class because it doesn't align with what I want to do in CS, but it is a course that has a lot of information that was hard but reasonable to understand.

What aspects of this class contributed most to your learning?

1. One of the most valuable aspects was the in-class exercise and the homework. The In-class exercises allowed you to work with the new material while also having other students and the teacher there to support you. Then the homework would build on this material.

2. Most aspects did not feel very helpful aside from some parts of lectures.

3. in class lectures and homework as well as exercises we did in class

5. The in class assignments.

6. Any time when Professor Pisan went over slides, exercises, or homework. It was most beneficial to learn directly from his explanation.

7. The HW we would have every two weeks

8. The aspect of the homework and in-class exercise helped contribute to my learning the most.

9. I think the nature of the content was what was most important to me. I found myself wanting to solve problems using assembly or making my own circuits. Having the content inspire me to engage with it more was integral to my learning

10. - Having access to the group exercise and homework answers as a reference

11. Hands on learning with the software

12. Homeworks allowed me to get a good understanding of the concepts without feeling too dreadful.

13. The logical circuit makes me understand how to change real life problem to 0/1question and implement as a real work.

14. The lectures were interactive and interesting.

15. I would say the homework assignments and the class exercises. There was a wide range of questions that covered everything we had gone over in class, helping me reinforce what I had learned.

16. The recordings were nice so that I could go back and learn the information again.

17. The professor taught the material well.

18. The labs and in-class discussions were helpful.

19. I liked the class lectures the most.

20. Recorded lectures were huge, I was able to rewind if I found a topic confusing and review the early material before the midterm and final exam. The abundance of practice problems were great as well, particularly the sample midterm and sample final. I was able to use them both as study guides and as practice problems.

21. The patience required to use keil microvision. Learning about computer memory and FSMs were interesting but were lightly touched on

22. The professor would always go over HW and discussion answers, so the students could understand why they got points off and where they can improve.

What aspects of this class detracted from your learning?

1. Some of the slides can be very confusing and require you the professor to be there to explain them in the lecture. But if you want to go back to review slides in the future they can be hard to understand.

2. Explanation were often unclear or confusing as it felt like the instructor was just reading off the slides without actually explaining how to do something and why. Lectures seemed to cover some relevant information but many times questions given in exercises or homework seemed to have barely been explained in class leading to frustration.

3. class project was kind of useless and stretched the entire course when I believe we should have rather done multiple less grand projects to get experience doing different things with assembly

5. The project was disconnected from the learning.

6. I feel that the biggest detraction was a feeling of confusion about how to approach and solve problems. I wouldn't say the contents are especially difficult, but it feels like there is some weakness in how the materials are communicated and taught.

7. I had to spend a lot of time outside of class trying to further understand the concepts causing me to fall behind on HWs or projects

8. Generally, none of it detracted from my learning. Most class events were on track to the topics of the day.

9. The presentations are not particularly consistent. Some lectures go over every minutia of a system or technique, while others only brush up on the concepts before moving on. It makes the class feel disorienting. The presentations don't have much information on them either, so studying from the slides is difficult.

10. - Slide presentations were very messy and cluttered - Instructions on projects often seemed inconsistent and confusing

11. Later half, everything was crammed in the second to last week of school.

12. Everything felt extremely rushed after midterms. Most of it isn't the professors fault though because of classes getting cancelled due to a plethora of reasons such the power outage that occurred and the class meeting falling on a holiday.

13. When explaining how the internal CPU works, I may not understand so much professional process and word explanation at one time.

14. The classes could be confusing at times.

15. Nothing really.

16. I think sometimes the slides were a bit bare and hard to learn from. The group work was also a little hard because sometimes you would get in a group that would not work together.

17. Nothing.

19. Sometimes it seemed like Pisan was not prepared for his class material, but this was only about 2 times so nothing major.

20. N/A

21. The amount of time wasted on learning keil. Given that no one in the industry uses it and computer science is a field driven by changes in the industry, it is almost disrespectful to students' time and not to mention money to force them to learn it. Professor Pisan made it endurable however.

22. I don't like hardware so I did not want to be there.

What suggestions do you have for improving the class?

1. The current format of the class was very well done especially how the final project was designed and broken into four separate parts. The second half of the class on finite state machines, flip flops, and memory was more difficult and tt would be beneficial if there was more time spent on that information, or more homework assignments covering it to allow students to practice the material.

2. It would be much better if lectures went over the important topics more carefully with more detailed explanations. Showing the process of solving example problems to the whole class and also explaining each detail without assuming students already know things would help a lot as well.

3. split the project into smaller more diverse projects and maybe even split the class into 2 because part of the class is circuitry and part is assembly which does fit together but having a class for each to dive deeper into each subject would be beneficial especially since this is a major course and not an elective

4. The lecture slides are good, but they are not helpful all the time, and sometimes, more virtual illustration is needed than reading over the slides. Not everyone's intuition/level of understanding of hard topics and concepts is the same.

5. More explanations of the project and course material

6. Working through real examples with the Professor was the best aspect of this class, and I would thoroughly encourage more of that. Particularly, having at least one walkthrough or key for any possible questions we might encounter would be good. For example, the midterm contained Memory map problems that were difficult for a lot of students. The problems aren't especially complex or difficult, but it felt like we didn't get to see how you solve these problems enough, and it was difficult trying to find resources on how to solve them (no memory map questions on the sample midterm).

7. More in-class examples during lectures, so we are able to take full advantage of the group exercises.

8. I think with more additional options for homework to study from, it would be very helpful to learn a topic if the majority of students are having trouble with it. The students could have a vote for which extra topics to optionally do for homework.

9. Make the presentations clearer, include things like the equation to get the selection bits for a particular chip combination instead of just expecting everyone to figure it out from the practice problems.

10. - Eliminate group work entirely, most times people don't talk to each other and nobody understands how to solve the problems, it felt like a waste of time - Reduce slide presentations to the bare essentials - Walk through the group work problems and show the class how to do them instead of forcing the students to do it themselves - Add quizzes in between exams to give practice for exam-type questions (and to encourage students to attend lectures in place of the group work) - Prepare better for lectures to reduce time troubleshooting issues with uVision or otherwise - The delivery of class information was often times so poor that it felt intentionally underdone to force students to self-research MOST IMPORTANTLY: - The class slides and homeworks could probably benefit from a total revamp to create a consistent, cohesive material set (the current iteration causes unnecessary time and energy expenditure on the part of the student)

11. Recommended Youtube videos post lecture

12. Some answers to problems weren't as deeply explained as it probably could have. For example, in the review questions in the bus and memory slides, whether it was verbal explanations or text from the slides, some steps would be skipped, causing confusion in how the answer was derived. The one question that especially comes to mind is the one on slide 22. I didn't understand where the 17 address lines came up until looking elsewhere and seeing that its log2(128KB).

13. That's all good but a little difficult for me.

15. I feel like the class is structured very well actually. There isn't I can think of that would make it better.

16. Possibly doing more in-class problems where the professor goes over them would be more helpful. Sometimes it is hard to learn off the slides.

17. To have the professor teach in more detail, the different mnemonics used in assembly at the beginning of the course so that it is easier to program in the language later on in the course. Also, have more detailed explanations for the answers on the answer keys for the homework and the in-class exercises. This would make it much easier to understand how to solve the problem and would facilitate studying and reviewing before the exams.

19. I wish some of the content that was not being tested was deemed so.

20. I do wish we would have been allowed to turn in work late at a penalty. Even if one were to catch up, chances of passing are very low as things are now.

21. Structure the course content to be more in line with how the industry is moving today. While the current course structure has some useful information, it does not need a whole course on it and students are better off saving time and learning the information from online resources that could sum it up in a few paragraphs as that is how unimportant it is.

22. Pretty good class considering, so I don't know.

IASystem Course Summary Reports summarize student ratings of a particular course or combination of courses. They provide a rich perspective on student views by reporting responses in three ways: as frequency distributions, average ratings, and either comparative or adjusted ratings. Remember in interpreting results that it is important to keep in mind the number of students who evaluated the course relative to the total course enrollment as shown on the upper right-hand corner of the report.

Frequency distributions. The percentage of students who selected each response choice is displayed for each item. Percentages are based on the number of students who answered the respective item rather than the number of students who evaluated the course because individual item response is optional.

Median ratings. *IASystem* reports average ratings in the form of item medians. Although means are a more familiar type of average than medians, they are less accurate in summarizing student ratings. This is because ratings distributions tend to be strongly skewed. That is, most of the ratings are at the high end of the scale and trail off to the low end.

The median indicates the point on the rating scale at which half of the students selected higher ratings, and half selected lower. Medians are computed to one decimal place by interpolation.[1] In general, higher medians reflect more favorable ratings. To interpret median ratings, compare the value of each median to the respective response scale: *Very Poor, Poor, Fair, Good, Very Good, Excellent (0-5); Never/None/Much Lower, About Half/Average, Always/Great/Much Higher (1-7); Slight, Moderate, Considerable, Extensive (1-4).*

Comparative ratings. *IASystem* provides a normative comparison for each item by reporting the decile rank of the item median. Decile ranks compare the median rating of a particular item to ratings of the same item over the previous two academic years in all classes at the institution and within the college, school, or division. Decile ranks are shown only for items with sufficient normative data.

Decile ranks range from 0 (lowest) to 9 (highest). For all items, higher medians yield higher decile ranks. The 0 decile rank indicates an item median in the lowest 10% of all scores. A decile rank of 1 indicates a median above the bottom 10% and below the top 80%. A decile rank of 9 indicates a median in the top 10% of all scores. Because average ratings tend to be high, a rating of "good" or "average" may have a low decile rank.

Adjusted ratings. Research has shown that student ratings may be somewhat influenced by factors such as class size, expected grade, and reason for enrollment. To correct for this, *IASystem* reports **adjusted medians** for summative items (items #1-4 and their combined global rating) based on regression analyses of ratings over the previous two academic years in all classes at the respective institution. If large classes at the institution tend to be rated lower than small classes, for example, the adjusted medians for large classes will be slightly higher than their unadjusted medians.

When adjusted ratings are displayed for summative items, **relative rank** is displayed for the more specific (formative) items. Rankings serve as a guide in directing instructional improvement efforts. The top ranked items (1, 2, 3, etc.) represent areas that are going well from a student perspective; whereas the bottom ranked items (18, 17, 16, etc.) represent areas in which the instructor may want to make changes. Relative ranks are computed by first standardizing each item (subtracting the overall institutional average from the item rating for the particular course, then dividing by the standard deviation of the ratings across all courses) and then ranking those standardized scores.

Challenge and Engagement Index (CEI). Several *IASystem* items ask students how academically challenging they found the course to be. *IASystem* calculates the average of these items and reports them as a single index. *The Challenge and Engagement Index (CEI)* correlates only modestly with the global rating (median of items 1-4).

Optional Items. Student responses to instructor-supplied items are summarized at the end of the evaluation report. Median responses should be interpreted in light of the specific item text and response scale used (response values 1-6 on paper evaluation forms).

[1] For the specific method, see, for example, Guilford, J.P. (1965). Fundamental statistics in psychology and education. New York: McGraw-Hill Book Company, pp. 49-53.