

MODULE REPORT

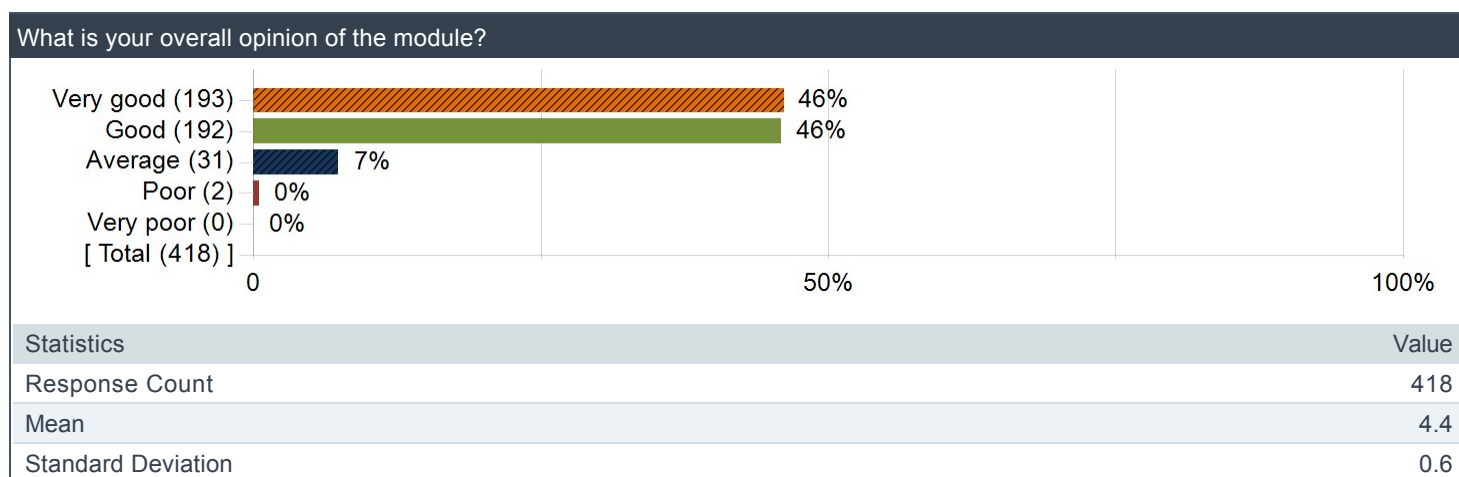
Module	CS2040S - DATA STRUCTURES AND ALGORITHMS
Academic Year/Sem	2020/2021 - Sem 2
Department	COMPUTER SCIENCE
Faculty	SCHOOL OF COMPUTING

Note: Class Size = Invited; Response Size = Responded; Response Rate = Response Ratio

Raters	Student
Responded	418
Invited	526
Response Ratio	79%

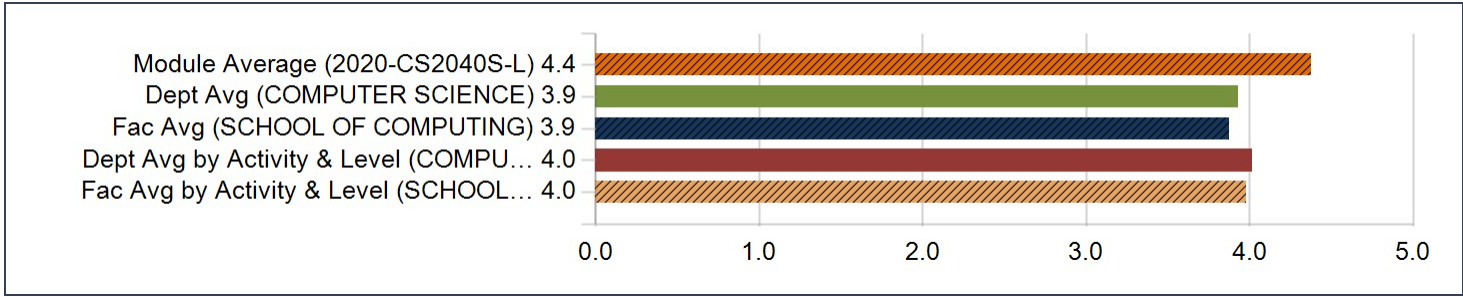
1. Overall opinion of the module

Distribution of Responses



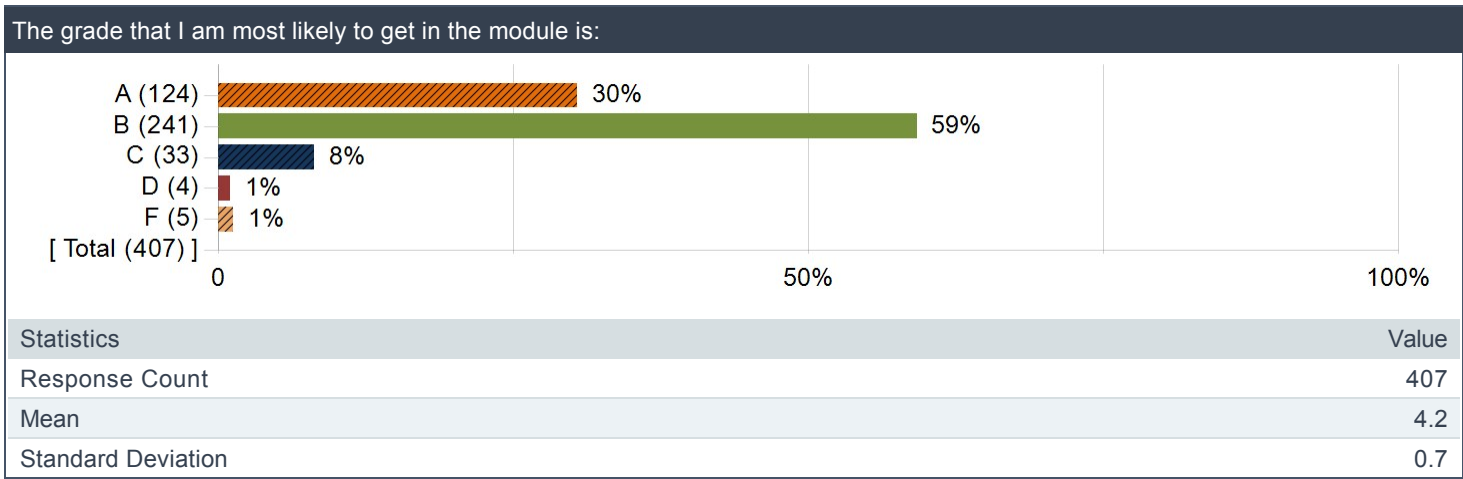
Rating Scores

Question	Module Average (2020-CS2040S-L)		Dept Avg (COMPUTER SCIENCE)		Fac Avg (SCHOOL OF COMPUTING)		Dept Avg by Activity & Level (COMPUTER SCIENCE-LECTURE (Level 2000))		Fac Avg by Activity & Level (SCHOOL OF COMPUTING-LECTURE (Level 2000))	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
What is your overall opinion of the module?	4.4	0.6	3.9	0.9	3.9	0.9	4.0	0.8	4.0	0.8



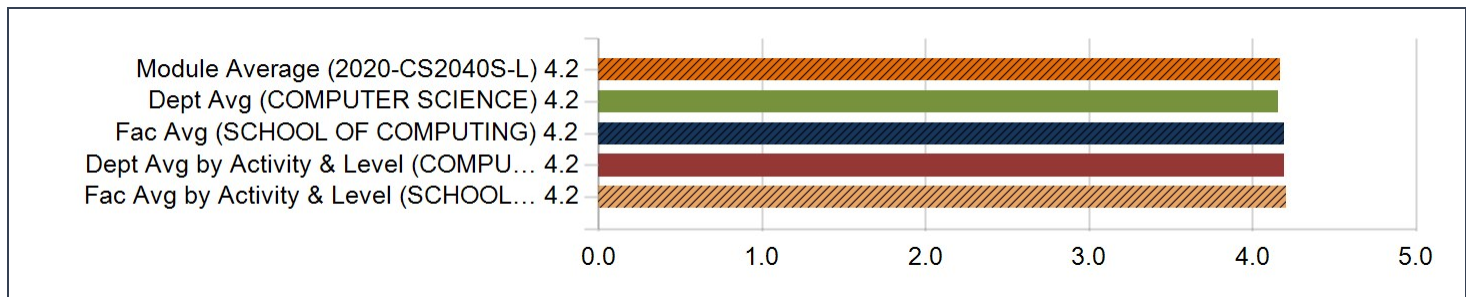
2. Expected Grade

Distribution of Responses



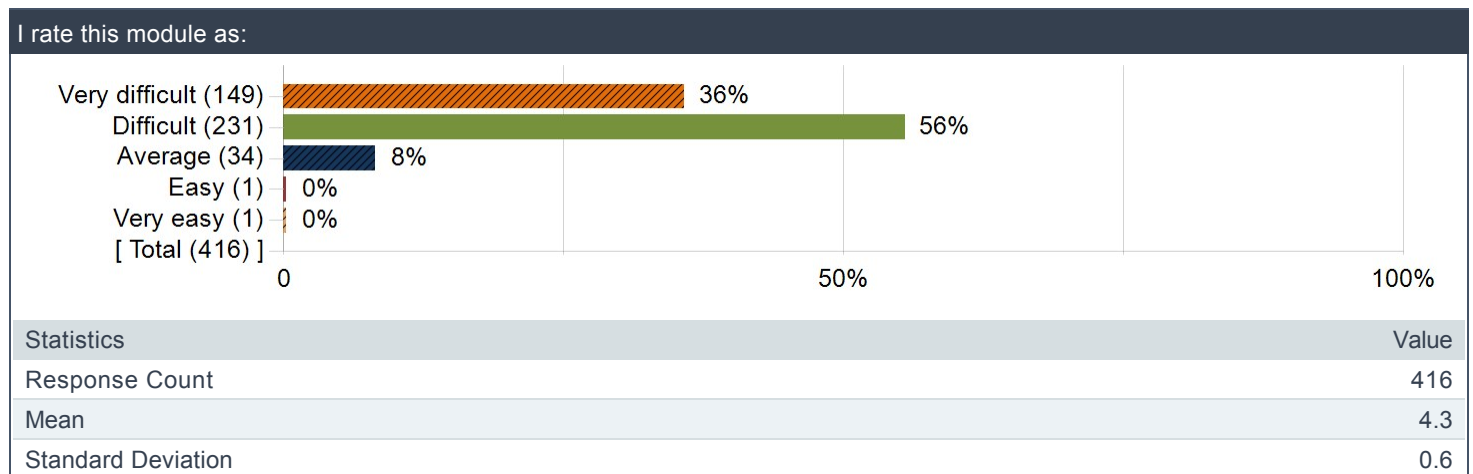
Rating Scores

Question	Module Average (2020-CS2040S-L)		Dept Avg (COMPUTER SCIENCE)		Fac Avg (SCHOOL OF COMPUTING)		Dept Avg by Activity & Level (COMPUTER SCIENCE-LECTURE (Level 2000))		Fac Avg by Activity & Level (SCHOOL OF COMPUTING-LECTURE (Level 2000))	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
The grade that I am most likely to get in the module is:	4.2	0.7	4.2	0.7	4.2	0.7	4.2	0.7	4.2	0.7



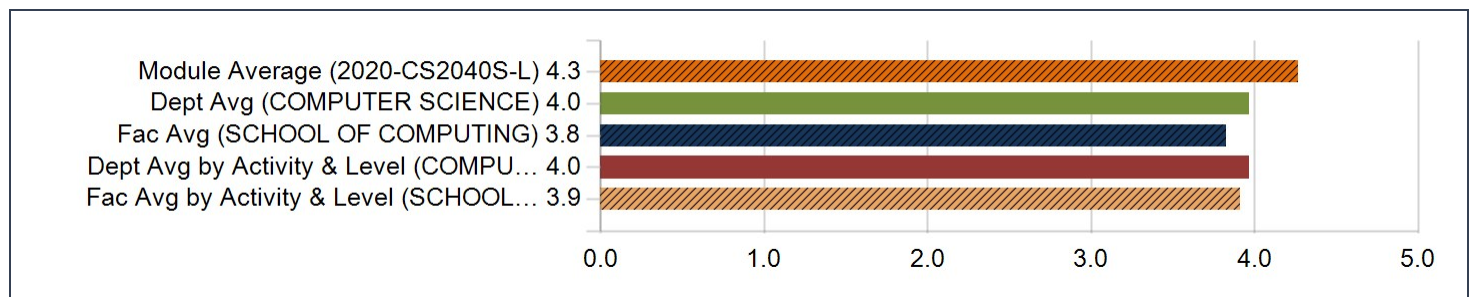
3. Difficulty Level of the module

Distribution of Responses



Rating Scores

Question	Module Average (2020-CS2040S-L)		Dept Avg (COMPUTER SCIENCE)		Fac Avg (SCHOOL OF COMPUTING)		Dept Avg by Activity & Level (COMPUTER SCIENCE-LECTURE (Level 2000))		Fac Avg by Activity & Level (SCHOOL OF COMPUTING-LECTURE (Level 2000))	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
I rate this module as:	4.3	0.6	4.0	0.8	3.8	0.8	4.0	0.7	3.9	0.8



WHAT I LIKE / DISLIKE ABOUT THE MODULE

What I liked about the module:

Comments
na
Wide coverage of content, focus on algorithmic thinking
I think this module is really useful
Dives into the core of Computer Science
Very interesting content.
data structures

Comments
the thinking process it taught me and the engaging teaching methodology it adopts
Rigorous course on algorithms and structures
Coursemology!
–
Learning new things that I may need in the future
Interesting and relevant topics for the field of Computer Science
Everything
Very thought provoking
The concepts taught are really interesting, and the use of Archipelago and Coursemology encourages participation (as Coursemology uses the concept of xp, levelling up, and achievements, like a game). The problems in recitations and tutorials really make use of what is thought in lectures so students can reflect on what was thought and apply the concepts.
i think it's pretty comprehensive in terms of coverage of DS and the core algorithms used in cs
.
Problem-solving experience.
Data structures and how to more efficiently write programs, as well as puzzle like problems to solve.
It teaches the fundamental theorem of Computer Science, the content is challenging and engaging.
Interesting problem sets and gave me an introduction and foundation in algorithms and datastructures
Fun in general, exposed to a variety of concepts Grading is transparent
Interesting module, fun problems and content.
Very useful and intriguing thought on algorithm design
very interesting
There's three different classes, lectures, tutorials, and recitations, and a lot of problems to work on, which really help me understand the concept taught in class.
Very useful in future
–
Learning how different algorithms work
The content taught is extremely useful and applicable to my course of study. I learnt so many new data structures and algorithms in such a short time, it would have taken me a much longer time if I decided to self learn them.
– i really enjoy learning about algorithms, i felt that what I was learning was alot more concrete than CS1101S, which i enjoy – the problem sets were genuinely enjoyable to do and i enjoyed watching lecture – I really loved the interaction in lecture with archipelego; i felt it got me thinking and engaged.
It is challenging.
Content of module, TA and Coursemology
The structure and effort put into designing assignments for the module. Very focused on learning rather than grades
I like the problems and concepts taught, and how the algorithms were derive to solve a certain set of problems.
The gamification of the module
Interesting due to the nature of the module
Learnt a lot about algorithmic problem solving. Very interesting.
The various data structures taught
the content itself
Interesting content that has many real-life applications to almost all fields of Computer Science
Challenging and interesting.
– interesting and engaging lecture
The flow of concepts and how the initial topics built up towards subsequent topics.
very interesting and fun. Open my eyes to a lot of new problems
It really makes me challenge myself, and the coding assignments are hard but very helpful in helping me understand lesson contents.

Comments
The PSETS were really fun and helped me reinforce the concepts taught
I enjoyed the delivery of the module as well as the lectures themselves. The lecturer was highly engaging and thorough with his explanations, and the concepts covered were highly interesting.
Concepts taught are very applicable to real-life programming.
–
The diverse weekly problem sets and the interactive cosmology platform
Most things are done in coursemology. Therefore, all we need to go to is only one website and it has everything. Good learning system.
many concepts were taught, interesting and useful knowledge on Java. There were many interesting problem sets that could prepare us for future interviews, which may be very useful.
Interesting problem sets and real world applications.
Problem sets are interesting and fun
I like how structured the module was and I really enjoy learning about algorithms. I am thankful that we get the chance to submit our code even after the deadline so that I can still attempt the questions.
The lecturer is quite enthusiastic and the course content is quite helpful which gives me insights about data structures and algorithms.
The various concepts discussed in class
It has its challenges, but not so much that it disengages me.
Enthusiastic professors
The content is cool, the gamified system is interesting
its content
Very interesting, many new concepts!
I liked the rigour.
I like this module because it teaches me data structures and ways to solve real-life problems.
The interesting algorithms taught
All of them
Very interesting and useful.
great quality content useful and important module
Lecture trainings help consolidate my learning.
I really learnt a lot of interesting algorithms in this semester and I feel like I can apply them into future.
The concept taught is interesting and the gamification of the module makes it engaging
Good foundation for CS
challenging
The gamification of the CA portion was very fun. The tutors and lecturers are very knowledgeable.
Rather interesting I suppose.
lectures were rly good and concise, content was hard but made interesting, gamification was interesting too
Helps me prepare for difficult coding problems/interviews
Provides a great platform to engage students and supports teaching staff to student communication.
Learn alot of new algorithms, and think algorithmically.
archipelago / zoom poll audience interaction to engage me and make me interact with the material as it is being taught
Introduction to data structures and thinking about what data structures could be best for what problem sets was very interesting.
It was interesting to see the many different solutions to problems in computer science, and how they are applied in real-life. It was especially eye-opening for me how many ways there are to approach a problem and how some solutions were better than others in certain ways.
Problem Sets are a fun challenge, the lecture is really fun to watch. Coursemology system is great.
rigorous, went in-depth on topics
The data structures & algorithms taught are useful and relevant in practical settings.

Comments
Excellent PSets, LTs, and other exercises
The content is very interesting and the lecturer (Prof Seth) was really engaging and good at communicating ideas. The problem sets were also interesting and well designed!
new understanding and appreciation for data structures and algorithms, and how to use them in different scenarios
fun assignments
Super fun module, definitely enjoyed it, algorithms is now my favorite topic
algorithms very useful for interview in the future
Cool to learn about different types of data structures and algorithms used in our daily lives
Learnt a lot of very useful things despite content being hard. Feels rewarding having completed the module.
Materials are well prepared and enjoyable to figure out, although difficult.
Many interesting data structures to solve problems
The problem sets are difficult.
fun to learn
Introduced different algorithms for various problems. Problem sets also provide good practice in implementing algorithms, providing a more in-depth understanding of the concepts taught in class.
I love everything about this module, just like I have to study for everything in the finals :)
I like the use of missions to help us decipher the data structures thought.
Lesson content.
Fun and relevant problem sets, gamification on Coursemology worked well.
-
It is very challenging. This is a love-hate relationship. Exposed me to mind twisting algorithms, data structures beyond the simple arrays I know. As someone who is very new in programming, the learning curve is very steep but ample practice is given. The tricks in this course is very helpful as well. Even though there was a lot of content, I am very thankful for being exposed to it (even though i wasn't that good at it).
Very interesting content.
Content is interesting, problem sets/tutorials/recitations were well crafted to ensure that we understood what was being taught.
xp system was pretty interesting
Challenging but fun.
The game sides of things is very fun. The content in general is quite exciting and quite stimulating for the brain. Makes me think and its nice to appreciate smart solutions to the problems.
The module really pushes me to come up with solutions to problems that have real-life implications.
Interesting to learn about algorithms
Content
The topics itself are very interesting and extremely useful to my career.
Interesting problems and content.
Its very engaging and the teaching staff (lecturers and tutors) really went out of their way to make the module fun by using coursemology, as well as tying the stuff taught in the tutorials to real life scenarios with some stories in the questions that make doing them much less dull.
Content is very interesting
Challenged me
algos
The problem sets really broadened my horizon.
I learned a lot of interesting problem solving techniques and algorithms.
Graphs
algo is fun!
Floyd warshall
This module introduced me to an important aspect of programming which is beneficial to my growth as a programmer. The content is also very interesting as I've learnt a lot of new algorithms I would not have encountered otherwise. The module's problem sets

Comments
are also very helpful as it allowed me to improve and practice my critical thinking and problem-solving skills.
Coursemology. Lecture recordings can be accessed via Youtube.
variety of algorithms and their applications
Gives students a strong foundation in data structure and algorithms.
The rigour involved in thinking and reasoning about algorithms and data structures.
Learning about the different algorithms. Problem Sets were interesting.
Lecturer is clear and passionate about the topics taught
Content and Problem Sets
Algorithms are interesting
I like 2040s
nil
Everything from the lecture, recitation and tutorial. Also the prof :)
The content was fun and i developed more interest in algorithms through this
The concepts is very interesting. The lecturers, tutor and recitation instructors were friendly and proficient in explaining the concepts, making the learning experience better.
It is based on pseudocode instead of actual coding, and thus allows us to further dive into theory instead of hard coding and brings more fun to the module
The concepts highlighted and the various use case.
Prof Seth, gamified experience (contests, missions, etc.), difficulty and depth of material taught
Covers a good variety of basic algorithmic concepts and their usage, good pacing during lectures and helpful recitations, tutorials and assignments.
very interesting topics, i enjoy learning most part of it, doing PSETS were quite fun, recitations were not fun at all. i enjoyed this module overall
Content taught was interesting.
Learning all kinds of algorithms and data structures. Thinking about challenging problems. Participating in archipelago sessions even though it may lag
Interesting.
Learning about the algorithms and data structures that people of the past have developed was an eye-opening experience where small theorems can seemingly solve amazingly large problems.
did not ask us about specifics in implementation as that would be more of debugging instead of learning data structures and algorithms
competitiveness
Learning new algos
Course materials are well prepared and the learning curve is made to be comfortable and gradual
The gamified system.
I like how the module does not stress students with grades, as most people will get to level 35 and nothing was released about the percentages of each examination, as it helps students focus more on the learning of concepts. I like how the module is structured more on the concepts than practising Kattis or solving problems, as it helps us delve deeper into data structure and algorithms rather than solving Kattis problems, which we could do on our own pace ourselves.
lots of stuff learnt. towards the end of the mod, seems like everything suddenly linking together.
Learning the algos are kinda interesting i guess.
The problem sets really pushed me to know my algorithms well
It is a good introduction to algorithms and data structures
Teaches good fundamentals.
Gamified coursemology (but bugs on it can be a pain sometimes)
Really fun problems and it introduced me to different ways of thinking
The gamification
It teaches core concepts of algorithms, which can be useful during interviews
Useful algorithms for solving complicated problems

Comments
It introduces many algorithms and data structures and their uses. The assignments also helps to reinforce the content and provides more insight into real world applications of the content learned
I liked the content taught though I did find it very difficult. I also liked the lectures and recitations.
Prof Seth is extremely good and he shows genuine interest in teaching.
The various data structures and algorithms which can be used to solve different problems.
It is fun to a certain extent?
it's very interesting
the topics covered were interesting
The problem sets are not straight-forward and promotes critical thinking and problem solving skills.

What I did not like about the module:

Comments
na
nil
Heavy workload
The test cases in Coursemology do not tell what is wrong with our solution.
there is no announcement when the problem sets are updated
relatively heavy work
High time investment required, difficult
-
Extremely heavy workload with very little time to study
Little guidance and very strict grading standards for continuous assessments
Recitations cover too much in too little time
Workload is abit high
The recitation and tutorial materials are really difficult, and while the midterm dates were really late, the finals dates are really early so there is not enough time to really try to understand and grasp the concepts.
.
Some questions can be hard.
The lecture and lecture notes was hard to follow, I usually had to find tutorials of the same chapter on youtube which was much easier to understand.
It can be quite frustrating and difficult many of the times.
MCQ exam, with each question carrying a heavy weightage
High workload Explanations could be clearer Should release solutions to problem sets Could spend more time on less problems in the recitation to explain the thought process
Coursemology.
The content was possible the most challenging out of the mods I taken this semester
2 page cheat sheet was difficult to manage
lots of content and lots of homework
the lecture slides not being released beforehand
-
Nil
Graphs are very complex. Some questions in Lecture Trainings are poorly phrased or have ambiguity.
- the workload is insane; but at the same time, i think most CS modules have pretty insane workloads. i just found it hard to cope during this semester because of the workload.
- i felt that the tutorial questions can be quite vague sometimes and hard to understand

Comments
– i would hope to have notes on the topic; if there were notes similar to CS2030s, i feel that it would enhance the ease and my understanding of the topics in CS2040s.
lecture training submissions times are very inconsistent
Difficulty in initially understanding content and applying concepts into labs and problem sets.
No pre-lecture slides, cannot study in advance
The difficulty in learning and understanding them fully.
NIL
Too much content in 1 module, I believe the scope is broad to provide us wider exposure but it is difficult to follow all within 3 months
The difficulty Hidden test cases No in-depth explanations given for mid term paper
Workload is on the high side
Too fast and too little taught practically
Nil.
– the teaching style of recitation and tutorial tutors is very unsuitable for me, so I didn't learn much from those two sessions
The difficulty of the pset is extremely high for the pace at which the course is taught, and there is insufficient time given for each pset, too.
Heavy, difficult content and workload (but probably CS standard)
The pace was too fast
Firstly, I did not completely enjoy the gamified aspect of the module. While it was in some ways better than the gamification of CS1101S, it seemed at times that a bit too much emphasis was placed on the gathering of experience. Additionally, the fact that tutorials and lectures provide experience needed to get to Level 35 did not feel like a wise decision; for tutorials, the experience awarded would be arbitrary and not consistent across the entire module, after all. And on occasions where other businesses had to be taken care of during lecture time periods, the advantage of online lectures is that the lectures can be recorded and viewed during another time, and therefore the need to attend the lecture is less prioritised in general; despite this, it seemed as though students were punished for not attending the lecture even when it was online.
It is also unfortunate that the module advertises itself as having to be taken concurrently with CS2040S. However, from the perspective of someone who had no real experience with Java before taking both CS2030S and CS2040S, I believe that this is entirely untrue; CS2040S should be taken after CS2030S for anyone with no experience with Java. Problem Set 2, for instance, was extremely difficult with no experience in Java; I struggled more with learning OOP concepts and classes in Java more than the algorithm problem itself, as it was yet to be taught in CS2030S. I constantly faced the problem where materials assumed to be taught in CS2030S were tested by problem sets in Week n, and I would only end up learning about those contents in CS2030S in Week n+1. This was not ideal especially since neither CS2030S nor CS2040S released the materials before the lectures. I would like to suggest that if the two modules (especially CS2040S) would like to advertise themselves as the "brother mods" to each other, then some form of co-ordination between the two modules' syllabus might be a good idea overall.
Huge learning curve.
–
Tutorials
NIL
Very stressful, too much contents taught over a short period of time. Marking scheme is rather inflexible, get penalised heavily when mistakes are made. Bell curve is very steep, tend to reward those with prior experience.
–
Workload is slightly high
The learning curve at the start is really quite steep and I fail to apply the concepts I have learnt from lectures to the theory questions/practical bits. I am bad with implementation and it takes me much longer, but the deadlines are never-ending :) I feel like there is really quite a lot of topics being pushed out and maybe I'm just a weaker student but it is sometimes hard to grasp.
The content is a bit too heavily and the workload is quite high. I don't feel I have enough time to digest the contents before moving on to the next sections.
I struggle with the mathematical aspects a little
Nil
Too much time taken up per week between the tutorial, recitation, and problem set. Also, many Lecture Trainings that are supposed

Comments
to help us to understand the lecture content better do not provide explanations for their answers.
It's too difficult for my slow brain
Very fast-paced and a lot of reading up to understand content
Spending sometime to briefly go through PSets would be nice.
I find that the Problem Sets are very tough. It is a huge jump from what is covered in the lecture. I also find that the experience points and leaderboard on coursemology give unnecessary stress to weaker students.
Maybe can split weaker students from stronger students
the back to back assignments with short deadline during the earlier part of the semester
Recitations can be somewhat confusing and some of the questions in the tests feel contrived.
don't have answers to any excercises.
high workload
The amount of graded assignments.
No.
Difficulty
Content is very dense and does not allow for much depth in each topic
nothing at all
The pacing of the 2nd half of the semester is extremely fast, and it can be hard to keep up especially with the difficulty increasing as well.
Difficult
-
Its very, very difficult.
NIL
Very stressful, and lack of practice..
Guidance for problem sets were insufficient, weightage of various components are not readily available, private testcases can be made more public as many students fail private testcases and have no idea why they failed
Can sometimes be frustrating to solve, especially private test cases.
Sometimes hard to follow
Too much content for what is meant to be an introductory course.
Terrible use of public & private test cases. Private test cases should *only* test for hardcoding and other deception, public test cases should cover all salient parts of code. Instead, I come across private test cases that test something public test cases have not tested, which is frustratingly bad design.
Furthermore, there should be a 'server load error' displayed instead of 'tests failed' when student submissions fail due to that. Would save a lot of student effort in redundant debugging.
The content felt a bit too slow at the start, and a bit too fast/rushed at the end.
content is very heavy, and slides can be better organised to facilitate better learning
really v tough..
Very hard
Very tough but understandable
Recitation and tutorial problems could be a little more guided or easier at the start to establish concepts before having tough and thinking questions.
The private test cases are painful.
sometimes can be really difficult especially the problem sets
NIL
the point of this module was to taught us how to use data structure effectively given problems, but it seems this module is more of a competitive programming where it requires us to do well quick or else we would love the marks.
Assessments
-

Comments
It is very challenging. This is a love–hate relationship. Content was a bit overwhelming. Because not only are we supposed to know the data structure, we were supposed to know it so well we can manipulate it to solve different problems. The learning curve is very steep for someone who hasn't read ahead.
Nil
Difficult and high workload
Workload can be quite high at times but I think its worth it for the practice
Would be fun to have a Practical exam.
Very fast and a lot of concepts.
There are only 3 graded components, making it more exam–heavy.
Quite fast paced
The module is extremely fast–paced and the workload is incredibly high. The sheer volume of content covered in 2040s makes it hard for the students to breathe and internalise current concepts, before the next content is out. Weekly workload took more than 6hours excluding the 3h lecture/1h recitation/2h tutorial slots.
Furthermore, it was very very difficult for students to plan for this module given that the coordinator did not release any information about the grading weightage for this module. This left all of the students guessing and very unclear as to how to gauge their progress in this module.
Difficult and time consuming problem sets. Too much content covered within a short period of time.
Its honestly a really difficult module, but the teaching staff really makes learning manageable.
Covers too much content, can be confusing. Very high workload
Difficult to keep up sometimes
algos
Too little emphasis on implementation. Too much emplasis on big idea.
Midterm
–NIL–
the difficulty of administration and the lack of explanation of unique features within assignments
Difficult and ps take up a lot of time.
The way information and content is being organized in the module – important definitions could be highlighted more prominently so that they can be more easily distinguished during revision.
Content was more focused on the theory, and less on the implementation of the algorithms. I would have liked for more examples on how to implement the algorithms to better understand them.
Workload is rather high for this module There were also a lot of content taught, with new content is taught in every lecture, recitation and tutorial. Might be a bit overwhelming.
Too much content
What the heck with the MCQ papers, it doesnt really test the problem solving skill
hard
None all good!
High pace was very stressful. Not sure if I could absorb everything right away. Steep learning curve
maybe my poor grades, but thats a personal problem
Spent a relatively large amount of time on this module.
–
The speed at which these concepts were skimmed through.
MCQ MIDTERMS AND FINALS DONT SHOW MY TRUE ABILITIES IN WHAT IVE LEARNT FROM THE MODULE! PLEASE stop hurting me.
–
slides are not available during live lecture, which makes it difficult to catch up after a slight slip. i think it would do a lot more good if slides can be made available during lecture (can be incomplete version without the archipelago answers) so we can also make notes on the slides and refer back to previous slides during the lecture. right now need to spend extra time to go through slides and watch video again after lecture which is not time efficient (yes i pay a lot of attention during lecture but often still have to rewatch video to make sense of the slides and make notes again :(((

Comments
too fast sometimes, content sometimes too difficult to understand, coursemology sometimes backfires in learning
Too much content covered. Gamified platform Coursemology invited unnecessary comparisons to others and was detrimental to learning.
Extremely high workload. Inevitable for a DSA module. Problem questions can sometimes be so tough, I get headaches.
Very difficult.
not enough practice for all concepts learnt. maybe for future iterations, the course can consider to having a lot more smaller problem sets but every problem set covers all the topics learnt that week. for example, we learnt how to implement avl trees but none of the psets made us implement rotations etc. it is only available as optional problem sets but those are way harder than the psets, which is counterproductive to getting students do them and learn. I would be interested in helping to transition psets into this structure (since it will probably take more than 1 semester to add more psets that follow this structure) and becoming TA but I need to get A- and above first...
competitiveness
Intense workload
Lack of face to face sessions
NIL
Sometimes the pace could get a tad bit fast, especially with recitations going over new content rather than reiterating what was covered.
Also is it possible to allow anonymous posting on coursemology? So everyone can feel more comfortable with posting, similar to Piazza.
i felt so depress coz of all the work from this mod. why is it that every week i have to do recitation tutorial pset and lecture training. and then i don't know how well i'm doing because there is no breakdown of what is graded and what is not. this lack of breakdown is playing mental games with my mental health although I would study hard regardless, I have anxiety issues and I can't sleep if I don't know the breakdown of the module.
The gaps between lecture and psets/tutorials/recitations. Certain concepts were quite confusing at first: i.e. hashing. Also while algos are certainly the focus, from an actual implementation point of view, hard to see how some solutions, i.e. ones in tutorials can be implemented. I think this also causes the gap in psets. While solution can be thought up of for the problems in psets, actual implementation becomes a problem, maybe a actual implementation can be provided instead of just pseudo code so a person that is not too familiar with java can refer to.
The lectures were, at times, rushed through
There is a bit too much content to cover, which makes each lecture and recitation a bit too fast to follow everything
Pace is very high.
NA except that it can be very difficult...
The sheer speed with which content is covered.
It was a little fast paced
NA
The psets were difficult but it definitely got easier towards the end.
Content is fast pacing and even if we understand the concepts. We are often overwhelmed by the number of concepts we need to know.
NIL
there might be too much content to be honest
inconsistencies in grading eg some TAs did not impose the late penalty for problem sets, some TAs were stricter in grading of problem sets.
Seems a little too difficult for students with little background in computing and experience in programming in Java.