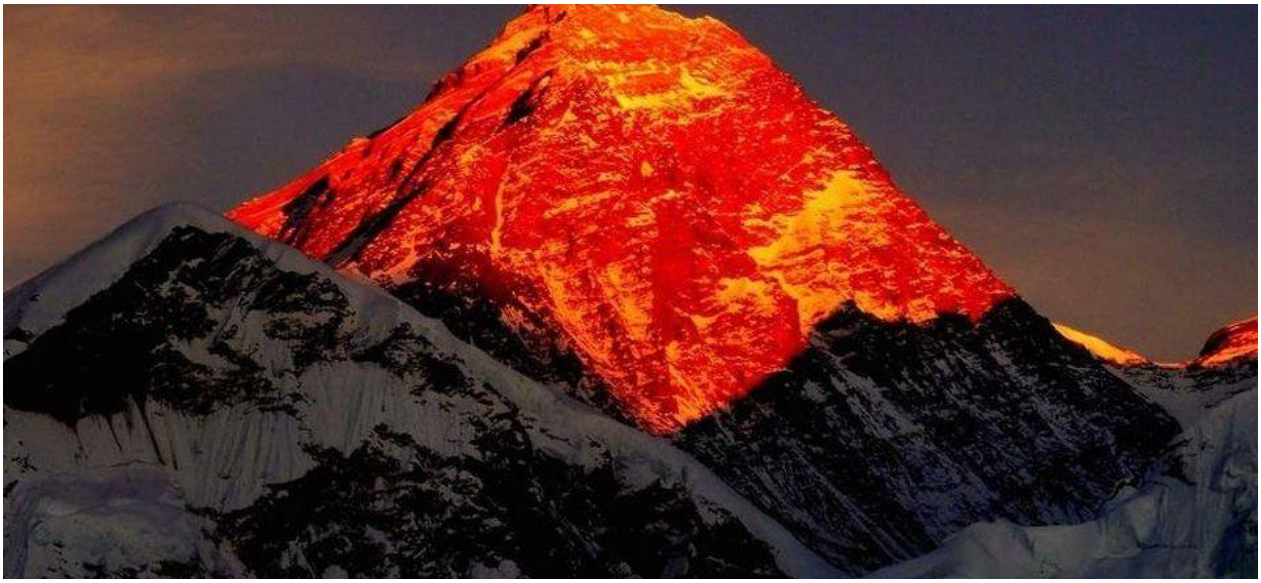
CS 2C Syllabus - Fall 2021

Algorithms and Data Structures in C++

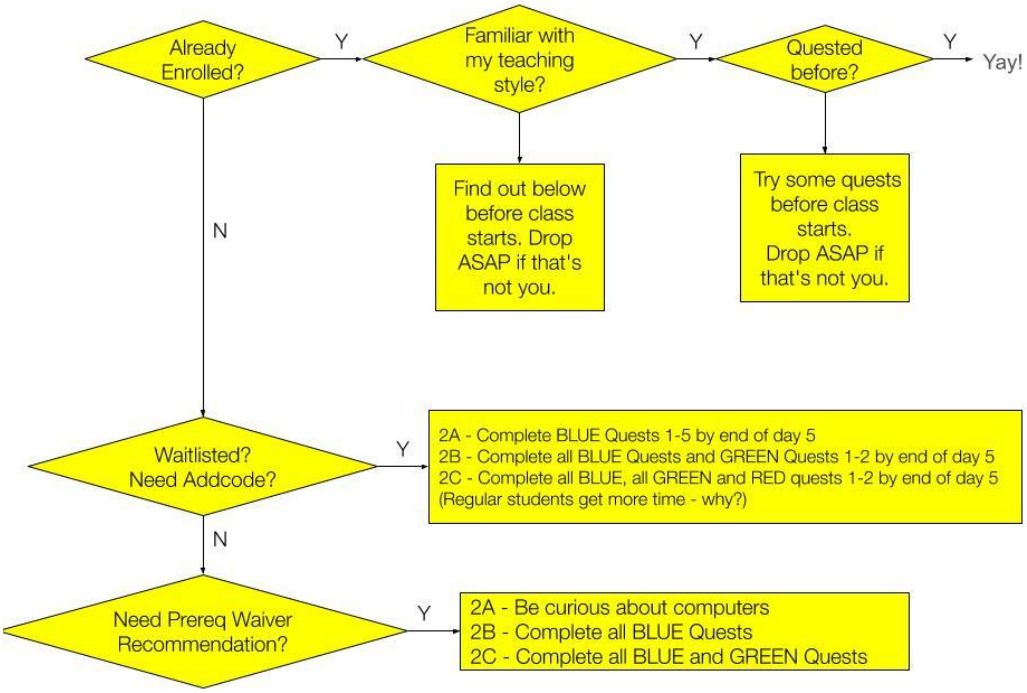
"You cannot beast mode code your way through this class" - John Vicino

Hey there. My name is Anand. Please read this syllabus carefully. You should especially read it if you have never taken a class from me before.



Jump To

First things first



Here is the way I approach teaching: I don't think I have ever been fond of stuffing knowledge down the throats of people who don't want it. But I believe that chances are high that if you've already sampled CS2A and CS2B and have come back for more, this is most likely your cup of tea and you want more of it.

If you're doing the quests for your own edification at your own pace - awesome. That's the way to be. No fun being full of stress, either before your tests or during your quests.

If you're just now venturing into real C++, and decided to dip your toes into CS2C, *be prepared to do a lot of self-learning*. If you think you are at risk of finding this class overwhelming, please consider restarting at the tiger asap and by solving each quest on your own. If you reach the RED quests that way rather than through the freebie password you got somewhere, you'll likely find it more rewarding.

On the positive side, you CAN always try to get the help you need by posting in our moderated 2A or 2B subs in addition to our section's 2C sub. They're not restricted to active Foothill students.

Note the following **essential** prerequisite skills.

- Looking up, evaluating, and using information on the net
- Following simple directions correctly (e.g. creating a subreddit user according to some requirements)

In my classes, you will largely self-teach yourself most of the material with help from your classmates. Your tutors and I will be watching, careful not to step in and give you the answer. Yes - You will NOT be given the answer. You cannot ask anyone to debug your programs for you. You have to find it yourself, although we will give you all the help you need.

Course Description

CS 2C continues where CS 2B left off. Students already comfortable with intermediate-level C++ programs will have an opportunity to play with and master important data-manipulation algorithms.

This course provides a systematic treatment of advanced data structures, algorithm analysis and abstract data types in the C++ programming language. Coding topics include building ADTs on top of the STL templates, vectors, lists, trees, maps, hashing functions and graphs. Concept topics include searching, big-O time complexity, analysis of major sorting techniques, top down splaying, AVL tree balancing, shortest path algorithms, minimum spanning trees and maximum flow graphs.

A working facility with simple algebra as well as good written English comprehension skills are both strong advisories to get the most out of this course.

Important note

By enrolling in this course in **Fall 2021**, you are implicitly agreeing that this syllabus provides a bare minimum of what you may experience during a one-quarter run of this class. However, experimental variations may gradually be introduced on a per section basis. You agree to be part of these too and to meet reasonable (as determined by me) additional flexible learning requirements that may be incorporated into this class before the finals (totals may be scaled appropriately if you're doing it for a grade).

Don't be an *unceremonious drop*

An unceremonious drop is when a student enrolls in a class, discovers they are out of their depth, and decides to silently exit the class without telling or thanking anyone. This helps no one, especially those in the waitlist who might have got into class if you had not enrolled.

Get a taste of how this challenging class will be by reading this syllabus and checking out the comments left by past students on our subreddit (They usually have titles like "Tips" or "Advice" for future students).

For most people, CS2A is NOT challenging even if you are not interested in computer science.

CS2B requires active interest in the subject and a desire to spend your spare time coding. All others will find CS2B moderately challenging.

CS2C requires more than an active interest in the subject. You must be passionate about computers, logical problem solving, critical thinking and programming, and be keen to learn as many new tricks as possible. CS2C will be easy for such students, but VERY challenging for all others, regardless of where and how long you have been programming in your life.

What is it like to be in this class?

I noticed a serious issue in the attitudes of some past students who seemed to believe that getting help is the same as getting answers. No. If this attitude is not corrected early, I think it will be highly detrimental to future learning of any kind, not just about computers.

This is NOT a class in which you will get answers. Our tutors are trained not to give you answers. You may NOT ask anyone to debug your code for you. However, we will watch your progress and struggles patiently and offer occasional targeted help to allow you to find the answer yourself, although it may be a more painful experience for you and there is a chance you may not find it before the course ends.

If you are not ready for this, and if in your mind, you equate "teaching" with "giving freebie answers without requiring original thought or effort", you will find that there is *no teaching* in this class. Then it is NOT for you.

Are there lectures?

For CS2A, I offer both pure virtual and synchronous classes whenever possible. Synchronous may be either face to face on campus, or via zoom.

For CS2B and CS2C, given the nature and depth of the material, there are no scheduled lectures. However, you can request any number of ad-hoc zoom lectures from me at any time. These lectures can be on any concept you are finding difficult to grasp. However, to get a lecture there must be:

- at least 5 of you with the same concept gap
- you should all attend the lecture with your camera on
- at least one of you should *drive*. This means that we will choose a sufficiently complex problem for the level you're enrolled in, and solve it live on screen, with the driver coding. The other students and I will be watching and helping.
- The lecture will be recorded and posted to our youtube channel. Your participation is implicit permission to post the video.
- Since these will be *unofficial* classes, you can ask me anything, not restricted to C++ or even CS. If I know something that will help you find the answer, I'll be happy to share.

CS2A students should consider lectures a great opportunity to get participation points. The only way to make up for lackluster forum participation is to shine in the lectures. Especially if you offer to drive and live-code.

Want to see other students live-coding in action? Check out our past recordings. I made a list (about 3 quarters of CS2A classes) at:

https://www.reddit.com/r/cs2a/comments/o2vpki/complete_list_of_recorded_classes

Office Hours

One time I happened to be in my office at 2AM. Someone knocked on my door.

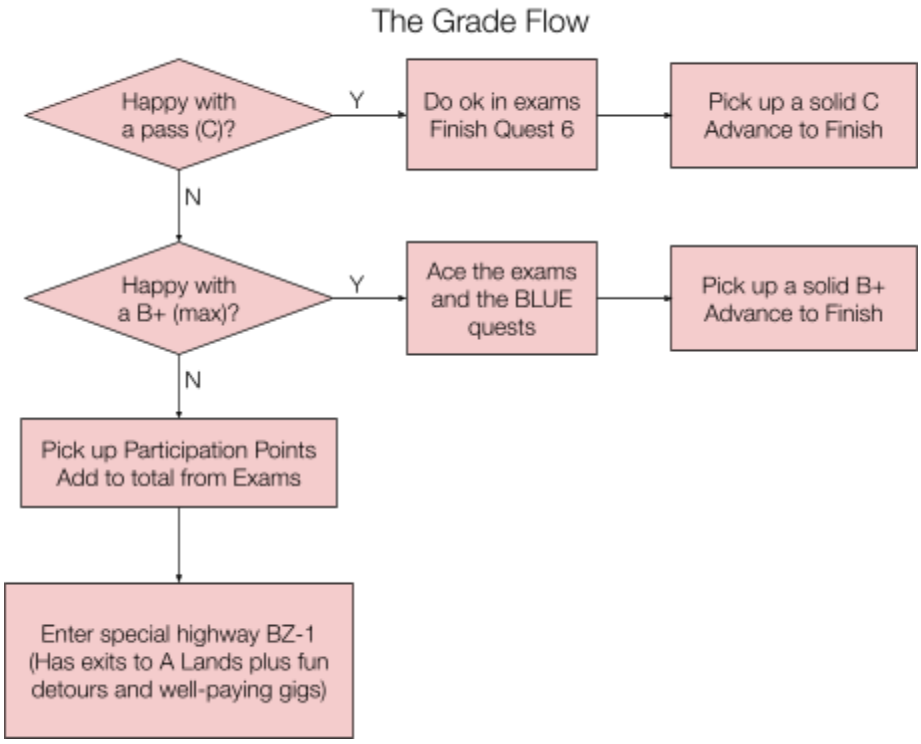
> "Who is it?" I asked.
>
> "Quick question prof" said a female voice.
>
> I opened the door. "Hey sorry. My office hours are at 10am. See the sign?" I pointed at the print out I had stuck to my door. It clearly said 10AM - 11AM in **BIG BOLD BLACK** letters.
>
> "Yeah" she said. "I read it. But I'm a binary janitor. So I waited up until now to come here."
>
> "That's cool. You definitely deserve an answer" I said. "What's your question?"
>
> "Would you like me to come back later to empty your trash can?"

This quarter, I've decided to do away with this confusion. I have open office hours ANYTIME. I am very flexible in being able to adjust to your availability. But you have to pre-arrange it with me via email first. The first 10 minutes of an office hour session may be spent in just questioning you to probe your depth of understanding of concepts needed to solve a problem where you are stuck. If you're having difficulty with pointers, for instance, I might first ask you to sit down and solve some problems involving pointer manipulations while I watch (without saying anything).

Once I know where you stand, I'll be much better able to offer you help. I will then be able to point you in the right direction for further experimentation. I will not look at your code directly, nor debug it for you.

Make sure you are comfortable with this policy before you enroll. If you are in 2B or 2C, you must be willing to be told to drop and complete an earlier course first to build up your foundations.

First Things Second - General Matters



YES! Whether you're doing this class to just get a feel for this thing called C++, whether you want to be good at it, but not necessarily make it the center of your programming world, or whether you want to learn from this class and prepare to dive into the depths of CS and swim with the sharks... this class has a track for you.

If you just want a smattering of programming knowledge in C++, you should complete quests 1-6, and do ok in the quizzes and exams. No need to participate in the forums. You'll get your passing grade.

For a B+, you should do well in your quizzes and exams, and also complete all 9 quests, without necessarily acing anything.

To get to A Territory, you absolutely need to earn participation points, which you can assume to be a proxy for evidence of productive collaborative programming, which is an important skill to have in the real world. How, then, can you earn these lucrative points? Read on.

Operational details

Canvas is our hub to coordinate some activities and take online exams. Most of the rest of our work will happen at other online locations, including youtube, zoom, quests, reddit, etc. You will start your adventure by posting an introductory note (required) about yourself in Canvas and/or reddit. You can simply reply to my own intro if you prefer. This is likely one of the few times you will actually post or reply in Canvas itself.

After that, we will use publicly available resources with discretion, courtesy and efficiency to share information and help each other, much as real professionals in the field do.

Don't say anything that you'll end up regretting. OTOH do try to let your natural genuine curiosity shine through. Maintain your profile on our subs as you would if you were a professional and it will free up a lot of your time.

I will try to remove posts that I deem (in my subjective opinion) to be a liability to your future self. But you can't rely on me. Best to be helpful, courteous, informative and only post useful tips, tricks and observations. They usually have more lasting value.

- Participating in the course discussion forums earns participation points (max 15).
- Not participating does not earn any points.
- Participating negatively by souring up someone else's experience earns negative participation points (no min).

How to get participation points

I know of two ways: (1) You can participate *wholesomely* in f2f class lectures (when offered) and (2) you can participate *wholesomely* in the class discussion forums on reddit.

What constitutes wholesome participation? It is when you are both a giver and a receiver. You not only ask questions, but also provide answers, courteous help, and useful directions without compromising your classmates' pleasure of finding out for themselves.

There is a subjective component to the collaboration points. By signing up to this course you agree that you accept my subjective evaluation of your collaborative input to award suitably normalized collaboration points towards your final grade. You will not know exactly how much it is. So please don't ask me.

Wholesome f2f class participation is when all of the following conditions are met:

1. You are present during class
2. You ask interesting questions
3. Your camera is switched on and you are "live" on it (ok to switch off for short breaks) - if virtual
4. You volunteer to drive or co-drive during at least one class (see past lectures on our youtube channel to find out what this means; may not always get a chance)

As before, if you're not aiming for A Territory, it's ok to attend class anonymously with your camera off (or not attend at all). You can still pass this class.[1]

[1] You can contact me beforehand if you are unable to be present on camera during classes.

Wholesome forum participation, which can be in addition to class participation is when your contribution to forum discussions are constructive, productive, and encouraging for those who are trying hard. To be on the safe side, consider adapting one of the following templates for your subreddit posts (customize as necessary).

Here is a useful strategy for those shooting beyond B+: Don't look up a solution on the sub. Try to solve it yourself. If and when you have to hit the sub, do it to ask a fresh new question in your own words, describing your particular problem. Only refer to past subreddit posts in answers to someone else's question (or other kinds of posts, like psas).

Note: Whether you're asking or answering, it's perfectly acceptable to say "*I tried u/XYZ's solution at [link to post] and it worked for me. My understanding of it is ABC. Happy to receive more light on this topic from someone who understands it better.*"

Template 1 (Asking a question)

Use something like the following template to ask questions. Don't refer to previous posts on the subreddit unless you're answering someone else's question.

> Hiya folks,
>
> I was trying to access XYZ in ABC in this quest, and kept getting my donkey bitten.
>
> I suspect that it's because of UVW. I tried to check by doing MNO, but it OMG.
>
> Help please?
>
> - eternally_grateful_all_of_this_year_2021

Template 2 (Giving an answer)

Use something like the following template to answer someone else's question. You can refer to past posts and comments here. You can post your answer *even if someone else has already posted one* as long as it is not the same perspective on the same answer.

> Hey eternally,
>
> I feel your pain. Have you tried IJK? Maybe share a screenshot of your error (without the password) and I can help better?
>
> From what you describe, it seems like you're having the same issue as this poster here:
>
> [Link(s) to past reddit posts]
>
> What's going on is that MNO goes out of bounds in the array when you use the -- operator on a size_t. I hope this helps.
>
> Let us know,
>
> - always_glad_to_help_today_0405.

Template 3 (General Banter)

Use something like the following template to share your wonder. You may refer to past and external posts freely here.

> Hello,
>
> Recently I was browsing past reddit posts, waiting for the next Black Mirror episode, and came across this incredibly helpful observation by a past student (u/UVW).
>
> When we pop an item off the stack in Quest 8, we don't return it to the caller. Instead we destroy it. Ever wonder why? Well I did.
>
> The reason has to do with: ABCDE...
>
> I hope you are as surprised as I was when I learned it.
>
> Check it out: [Links to past and other external posts]
>
> - ever_curious_at_this_moment_00

Template 4 (Initiating discussion about something in a f2f class)

Use something like the following template to post something about the content for that week from previous lectures and external sources.

> Hello questers,
>
> This week we were supposed to play around with the topics - BCE and CED. These topics are discussed in the Week N youtube videos of past quarter recordings.
>
> 1. https://youtube.com/[nonlinearmedia channel]/... watch?v=ABCDE&t=34m23s (from Winter 2021)
> 2. https://youtube.com/[nonlinearmedia channel]/... watch?v=ABCDE&t=34m23s (from Spring 2020)
> 3. https://youtube.com/[somewhere else]/... watch?v=ABCDE&t=42m3s
>
> So I can understand why we say "EFG" whenever we check for "PQR", but it seems to contradict the other video (#3) from XYZ.edu. In fact, later in video #2 (around 43m) it seems to contradict what it said earlier at 34m23s.
>
> Anyone care to shed more light on this?
>
> - bored_with_linear_content_2021

Refer to past questers whenever possible (and not asking a question). You can credit them by tagging their username in addition to sharing their link.

And, ofc, you don't have to use the exact same words as these templates. Say it however you want. They just show you the critically required elements of your posts and/or comments.

Common issues in getting participation points

"I found the answers to my issues in the subreddit. So I didn't have to post for the answer."

> Of course you found the answer there. I'd be surprised if you didn't. Unfortunately, that means that you didn't struggle to find it yourself. Using help from past questers without overtly acknowledging them may not be a nice thing to do, but it certainly won't get you any collaboration points.
>
> By doing this you're implicitly suggesting to me that you're driving in the B+ lane. You can switch lanes, but it is difficult to switch into a faster lane unless you've been driving as fast for a little while before the lane change.

"I'm uncomfortable with showing my face on published videos of our class lectures (and so my camera has to be off)"

> It's perfectly fine as long as you tell me beforehand and we arrange for a suitable alternate way to establish your active presence. Otherwise, *enrolling in this class is implicit permission to publish videos in which you may appear as a student*.
>
> Why not turn this to your advantage and make it a bullet in your portfolio. E.g.
>
> - ...
> - Youtube link in which I coded live - [link to vid]
> - ...

Assessment

If you're doing this course for kicks, or other fun reasons, you can skip this section.

If this course is offered for a grade, and you are taking it for a grade, then, your final grade will be based on programming quests (scaled to 60%), participation (scaled to 15%) and exams (scaled to 25%). I will then use the absolute grading scale below:

For an	A+	A	A-	B+	B	B-	C+	C	D	F
You need (%)	97	91	88	86	80	78	75	67	60	< 60

The assessment has been designed to test both conceptual understanding and knowledge of practical issues. The quests emphasize the latter and the exams/quizzes emphasize the former. The idea is that you should be able to get a passing grade by doing well in the quests and moderately well in everything else, but in order to get into A-grade territory, you have to demonstrate a solid grasp of the concepts and good class citizenship[2]. An A+ is possible if you truly enjoy programming, program in your spare time for fun, and take the trouble to independently look up, discuss (in the forums) and learn topics I will announce from time to time in announcements.

With that said, if you're focused solely on your grade and do everything flawlessly by the book, but fail to demonstrate good conceptual understanding, you will likely not get an A in this course.

In this course there will be:

- 9 Mystery Quests you will solve at the average rate of about one per week (your own pace). These quests need to be solved using C++ (worth 60%)
- 1 midterm and 1 final exam (worth 25%)
- Online participation (worth 15%)

Mystery Quests (capped at 215 for CS2C this quarter)

You will solve these at our public questing site (https://quests.nonlinearmedia.org). Each quest will give you a certain number of trophies. You can check your total trophy count at any time by visiting our /q site.

The password for the first quest can be found by solving all the BLUE and GREEN quests (doesn't count towards your grade). These quests button down your CS2A and CS2B knowledge to better prepare you for CS2C. Start at the tiger. If you haven't discovered the password by the official start date, send me an email with ONLY the following words:

"Hey &, Could I please have the password for the first RED quest?"

[2] "How does good class citizenship contribute to learning?" you ask. Good question. I'm using it as a suitably weighted proxy for confidence in a person's conceptual knowledge. In the past, I noticed a good correlation between a person's understanding of a concept and their willingness to explain it to someone else.

DON'T try and explain. If you do offer an explanation, I will have to understand it first, and then ask a number of personal questions to get to know your life situation in detail so I can put your explanation in context, which may delay your password unnecessarily.

Such students have tended to ask slower-lane questions in the fast lane where many questers are zipping by at high speed. To avoid this and keep your learning experience fun, I'd like to know who didn't complete the BLUE and GREEN quests so I can keep a closer eye on their activities and progress.

The quests are set up such that the password to each quest is given out upon scoring a certain number of trophies in the preceding quest. However, in the first quarter of questing, I found that a few students were getting stuck in the lower numbered quests pounding away at them to eke out every remaining trophy before moving on, even though they had already earned the password. This is a bad strategy. Keep moving when you get a password. You can always come back to polish your previous quests when you have free time before the freeze date.

At the end of the quarter, your total trophy count will be capped at **215** and scaled from **215** to 60%. If you spend a lot of effort getting up to high numbers by the time you get to Quest 7 already, then you'll be close to getting burned out right in time for two of the funnest quests of all. So plan your time and effort wisely. It's not like your old quests are going to disappear when you move on.

Exams

You will have one midterm exam on the Thu of Week 6 (Oct 28) and one final exam on the Thu of Week 12 (Dec 9). The midterm is worth 20 points and the final 40. Together, their combined score will be scaled from 60 to 25%.

These exams are objective style and will be administered via Canvas. You will typically have a window of time (18+ hours) during which you can begin these exams. But once you begin, the current version of Canvas does not allow you to *pause* your exam and come back to it. The 1h (or 2h for final) timer cannot be stopped once you start it, until you hit finish.

All exams are open-book and can be taken anywhere you get a decent Internet connection. I don't recommend taking it on mobile devices.

I'm not going to be able to prevent cheaters. But keep in mind that cheaters only cheat themselves. Copying is a waste of your time. Few good software companies employ programmers based upon their qualifications if their demonstrated competence doesn't measure up to their stated expertise.

Besides, you'll find that copying robs you of a great opportunity to really learn the language and having a load of fun.

Participation

This is worth a whopping 15%. To put it in perspective, imagine that you were taking this course for a grade.

If you do everything else flawlessly, except participating in the online class, then you can get a maximum of 85 points. It translates to a grade of B+.

To make it into A territory, you not only have to be good at what you do, but must be able to explain concepts to others in your own words. The participation score is a confidential number I keep in my own spreadsheet by continuously monitoring the discussion forums and estimating how helpful, informative and/or encouraging each participant is. If you don't show up here, you are not deemed a participant.

You can use a thumb rule and give yourself 1 participation point for every helpful post you make in our sub. Add 1 more if the person for whom your post is meant follows up thanking you for a good tip. Subtract 1 for each unhelpful or mean post and a further 0.5 for each post that got deleted by a mod. If you're over 16 (I mean participation points), you will likely try to avoid the first negative one - it will reset your total to 15. This means everybody who earns a reputation as a helpful dude gets exactly one freebie mild invective, which they'd be wise not to use.

College Recommendations?

Many students who complete my CS2B or CS2C successfully ask me to write college recommendations for them. I don't write or make comparative recommendations for students, nor provide my opinion or evaluation of your current or future abilities. I do not share the grade you earned in my classes.

However, I can help you help yourself by giving you the chance to point the admissions officers at your work (e.g. your reddit posts).

Preparatory Tasks

You must complete the first required task for this course by midnight of the first day of the quarter. This is just a simple 3-question quiz that **does not require prior knowledge of C++.** If you don't complete this task, you will be dropped and your seat likely given to a student on the waitlist. Consider this the equivalent of showing up to the first lecture. Not doing it will be treated as a no-show to the first lecture.

Also, if you think you may be dropping this course, I urge you to drop ASAP so I can give your seat to someone else on the waiting list.

Weekly Time Estimate

Programming, like all art, is not a 9-5 job. Sometimes you're on a roll and killing it. Other times, not so much.

I know how it is.

So there are no regular papers or labs due every day or week in this course. Rather, like real projects, there are deadlines you should strive to meet. You can plan your own time in your own way. Below is one suggestion:

Week	Read References	Complete	Notes
1	Algorithms and ADTs review	Mystery Quest 1	
	Algorithm analysis	Mystery Quest 2	
3	Time complexity and Big-O	Mystery Quest 3	
	General trees (and BSTs)	Mystery Quest 4	
5	AVL Balancing and Splaying		Quests 1-4 Freeze
	Review/Midterm (Canvas)		
7	Hash tables Quadratic probing	Mystery Quest 5	
	Sorting	Mystery Quest 6	
9	Priority Queues, Heaps, Heapsort	Mystery Quest 7	
	Dijkstra's and Kruskal's algorithms	Mystery Quest 8	
11	A Maxflow algorithm	Mystery Quest 9	Quests 5-9 Freeze
	Final Exam (Canvas)		

Every week, give yourself one or more topics to study and one or more programming quests to complete. If you have some programming experience already, expect to spend about 8-12 hours per week reading and/or attending lectures or watching videos. Budget an additional 10-15 hours for working on programming quests. To be on the safe side, budget about 25 hours per week (initially) for this course.

Learning Resources

Rather than prescribe any particular resource,

- I'll give you a list of topics we'll cover each week.
- You should refer to sources (including the recommended text) to find out more about these topics. I will suggest two.
- Also check this complete list of recorded CS2A lectures with student participation (from about 3 previous quarters).

My first resource suggestion is the book: *Data Structures and Algorithm Analysis in C++*, any Edition ≥ 2nd, by Mark Allen Weiss, Pearson.

You can order it through our bookstore at http://books.foothill.edu/, phone: (650) 949-7305. But I recommend that you pick up a free or cheap online copy. Ask in the subreddit for help. Or simply email a request to the author himself.

The second is a past fork of CS2A modules that ex-prof Michael Loceff created when he taught this course. Thanks to Michael, I'm able to make these available to you. Click on the appropriate link below to access them:

- https://quests.nonlinearmedia.org/foothill/loceff/cs2a
- https://quests.nonlinearmedia.org/foothill/loceff/cs2b
- https://quests.nonlinearmedia.org/foothill/loceff/cs2c

Although a couple of revisions behind, much of it is still relevant to this course. It is essentially a *distillation* of selected topics from the text. But be aware of salient differences between the content of his modules (or the text) and what some of our quests require. This shouldn't be a problem if you understand the concepts. But it will be a problem if you don't.

As always, hit our sub, when in doubt.

Actually, that's not quite right.

When in doubt... try it out.

If you still don't get it... hit our subreddit.

Other Resources

The department maintains a blog called Opportunities for CS students. It contains announcements of internships, scholarships, free software offers, public lectures, etc.

Lane's Lane

The Foothill STEM Center already provides fantastic assistance by making experienced CS tutors available for 1-1 real-time (synchronous) assistance almost 24/7 (via zoom) and generous hours in the STEM Center when the campus is open. Within the STEM Center, Lane Johnson hosts two special workshops each week focused

especially on helping questers. Look for their actual hours on our sub, or simply check into the STEM Center sometime and ask for Lane.

Canvas

This quarter, we will be using Canvas ONLY for the following:

- Reading announcements, reference material (modules) and the syllabus
- Introducing yourself with your reddit handle (your only required post in Canvas)
- Taking quizzes and exams
- Reviewing quest/test scores when they are ready (will be announced)
- Accessing virtual learning resources such as the STEM center, online tutorial rooms, etc.

Make sure your Canvas configuration settings are such that you get notified when there is a new announcement.

I am not using the Discussion Forums feature of Canvas.

Discussion Forums

This quarter, we'll continue to use our RED subreddit for all quest related discussions. Please note the following important information:

1. DO NOT SHARE personally identifying information of any kind. However,
2. No matter what your avatar's name, you must sign your posts with your first name (I strongly discourage unsigned posts. A reply should be able to start with something like "Hi John"
3. Your avatar name should start with your first name and an underscore, followed by your initial (or full last name) + some optional digits
4. You should never post your student ID (CWID) online. A lot of personal information about you can be unlocked by someone who has it.
5. If you have something negative to say about someone's post in the forums, you should direct your concern to me, not to the person in the forum.
6. KEEP IN MIND that these discussion posts will persist into the next quarter and later for future students. So everything helpful you say will help far more students than just your current classmates.
7. Use Canvas for anything not quest-related (enrollment, exams, modules, etc.)
8. No posting source code and fishing for answers. Debug your own code.

Keep this in mind: ANY user anywhere in the world can quest and post/discuss in our subreddits. So you may see posts and replies by users with anonymous names like *coding_lion*, *bat_girl* and such. All posts are subject to the same rules like *Johnny be good*, but only the ones with avatar names matching the spec in this syllabus will get participation credit.

Getting started on your Mystery Quests[3]

The password to the first quest can be discovered by solving ALL of the BLUE and GREEN quests. If you are proficient in CS2A and CS2B concepts, this should be straightforward. You get 3 days of relatively low course load at the beginning of the quarter. Use it to discover this password. After that, it's your responsibility to not only find the password, but also catch up to the pace that the rest of your class may have reached (You can give up and request the password any time). If you're not all that confident with C++ yet, you better start already - this syllabus should be in your hands at least a week before class starts.

Passwords for subsequent quests will be automatically revealed upon *satisfactory progress* (as the machine sees it) in each preceding quest.

In order for rewards from a quest to count towards your total, you must have completed all previous quests. If you leave a hole in your trail of completed quests, then your total reward earnings is the sum of all rewards you earned before the first incomplete quest.

Bugs in your code?

Getting your code debugged by someone else is NOT allowed. That includes me, your tutors, teachers, friends, enemies or relatives. Debugging your own code is an essential skill that aspiring programmers must learn and enjoy - Yes, enjoy!

Of course, I can't police this. But your enrollment in this class signifies acceptance of this condition (in addition to being bound by Foothill's Academic Integrity Policy). You cannot send your code to me, a tutor, a friend or relative and ask them what the issue is. What you can do is:

1. Explain (in our subreddit) what you're trying to do
2. Describe in English the detailed steps you would need to undertake (pseudocode)
3. Describe the behavior of your program and ask why it diverges from (2) if it does

Sometimes, a tutor, a fellow student or I may get curious about your code and want to see it. Under these exceptional circumstances, you can share your code on request.

Sometimes it is also ok to post your code on our subreddit. Mostly, exercise good judgment regarding what can be shared. You want a fun and fulfilling learning experience. The best way to get it is to keep it fun and fulfilling for everyone. You wouldn't give away a movie's ending to a friend who's going to watch it. Why give them the solution to a problem when they can feel good finding it themselves?

Extensions

Extensions don't make sense because the quests are self-paced. You just have to complete each by their "freeze" dates to get credit. After their freeze dates, you can still complete them, but not for credit. There's a LOT of time to complete these quests even if you have to take some breaks. So, please don't ask for extensions.

[3] "Where can I find these quests?" Hmm... that be yore first quest. Or metaquest.

Programming style

My personal preference for program formatting is the C++ equivalent of the classic K&R style for C. It's not imperative that you follow the K&R style. I'm ok with any consistent and clean styling/formatting of your programs.

Compilers

Use an IDE/compiler of your choice. But you'll find better support from me and the STEM center if you stick to one of the environments we know about (ask).

Communication

Please use our sub for any question or comment that relates to the quests (except questions of a private nature). If you have a confidential question (grades or registration) you can email me. If you have a question that only makes sense with material you can find in Canvas (e.g. modules, syllabus, exams, etc.) then it makes sense to post that question in Canvas rather than our sub.

Try to meet with each other after class (even if virtually), set up private study and programming groups and work on independent (non assignment) programming challenges outside of class. I'll give you a few interesting challenges from time to time. Some of these may earn you extra credit.

You can reach me via messaging in Canvas, Reddit or by email. While on campus, my room number is `0x113d` (in hex). If you did my CS2A successfully, you know how to decode that into decimal.

One-on-one meetings are only for discussing confidential stuff. You cannot privately ask me for an explanation that is bound to be generally useful. And you cannot show your quest code to anyone (including me).

Course outline and SLOs

You can access the official course outline of record for all CS courses here. Student Learning Outcomes for this course are:

1. A successful student will be able to write and debug C++ programs involving advanced data structures such as Lists, Trees, Graphs. They will be familiar with the use and implementation of algorithms for balancing binary trees, creating splay trees, minimum spanning graphs, finding the shortest path through a graph, and maximum flow through a network. They would also be familiar with the most common sorting algorithms and know the advantages and tradeoffs of each.
2. A successful student will be able to reason about the running time and derive properties of computer programs using precise mathematical terminology. Specifically they will be conversant with the Big-o notation and be able to craft efficient algorithms using the appropriate data structures to solve non-trivial computational problems.

Disability Resource Center

Foothill College is committed to providing equitable access to learning opportunities for all students. Disability Resource Center (DRC) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you have, a disability in any area such as mental health, attention, learning, chronic health, sensory, or physical, please contact DRC to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DRC and have a disability accommodation letter of accommodations set by a DRC counselor for this quarter, please use Clockwork to send it to me and discuss accommodations..

Students who need accommodated test proctoring must meet appointment booking deadlines at the Testing Center:

- Exams must be booked at least three (3) business days/weekdays in advance of the instructor approved exam date/time.
- Finals exams must be scheduled seven (7) business days/weekdays in advance of the instructor approved exam date and time.

Failure to meet appointment booking deadlines will result in the forfeiture of testing accommodations and you will be required to take your exam in class.

Contact the DRC if you cannot find or utilize your MyPortal Clockwork Portal. DRC strives to provide accommodations in a reasonable and timely manner. Some accommodations may take additional time to arrange. We encourage you to work with DRC and your faculty as early in the quarter as possible so that we may ensure that your learning experience is accessible and successful.

To obtain disability-related accommodations, students must contact the Disability Resource Center (DRC) as early as possible in the quarter. To contact DRC, you may:

Visit Darcy in Building 5400, Student Resource Center: (physical visits are suspended during college closure)

- On the web: http://www.foothill.edu/drc/
- Email DRC at drc@foothill.edu
- Call DRC at 650-949-7017 to make an appointment

Important Dates

For a list of important dates for the fall quarter, see the official college page here.

Happy Hacking!

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