

CPSC 5041-02: Computing Systems Principles I

Winter 2023

The policies and schedule contained in this document are subject to change.

Course Description:

The course is about computer system infrastructure, implementation, and design. Topics include computer organization, resource allocation and scheduling, and memory. Development of imperative C++ programs using dynamic memory.

Instructor Information:

James Obare

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(Please place 'CPSC 5041-02' somewhere in the subject for quicker replies.)

Response times

I will check my email regularly. You can email me at any time, but you may not receive a response outside regular business hours. Generally, emails received before 3 p.m. will receive a response before 5 p.m., and emails received after 3 p.m. will receive a response on the following business day. Business days are Monday–Friday, except for holidays.

Office Hours: (Tuesdays.)- 05:00 pm-06:00 pm

Course Information:

Credits: 3

Location: BANN 401

Class Times: 6:00 pm – 8:40 pm on Tuesday

Class Website: <https://seattleu.instructure.com/>

Prerequisite: This course assumes prior course work in programming fundamentals and data structures. C grade or better in CPSC 5005 and CPSC 5011 (May vary depending on individual)

Learning outcomes:

At the end of this course, the student should be able to

- A. Perform integer and memory address calculations.
- B. Write system-level programs using systems calls that use pointers and dynamic memory appropriately.
- C. Describe the key components of a CPU and how instructions are executed within a CPU.
- D. Describe how caches behave and their role in the memory hierarchy.
- E. Compare and contrast the common policy decisions / algorithms used in scheduling.
- F. Describe how an OS manages processes and computing resources (including I/O devices).

Tentative Course Topics:

- Data Representation
- Overview of Computer Organization
- Memory and Addressing
- Overview of Operating Systems
- Processes and Scheduling
- I/O

Instructional activities:

Class time will be spent on lectures, discussions, and exercises.

Textbook: (Optional)

Operating Systems Concepts, 9th Ed., A. Siberschatz, P. Galvin and G. Gagne, Wiley.

Structured Computer Organization
Andrew S. Tanenbaum and Todd Austin
6th edition
Publisher: Prentice Hall
ISBN: 0-13-291652-5

Grading:

Homework Assignments 50%

Assignments are a mixture of written homework and programming assignments. All assignments are weighted equally.

Midterm Exam 20%

There will be one midterm exam occurring in the middle of the quarter. The exam date will be announced in class at least one week ahead of time. The exam is closed-book. Use of any electronic equipment is prohibited.

Final Exam 30%

The final exam is cumulative with an emphasis on material covered after the midterm exam. Like the midterm exam, the final exam is also closed-book, closed-notes except for ANNA assembly language sheet of notes. Use of a calculator is permitted. Use of any other electronic equipment is prohibited.

Please Note: ***This Schedule is Subject to Change.***

Week	Unit	Topic Discussion	Assignment Due
01/10	00 01	Course Introduction Overview C++ Programming (In-Class Activity 1)	(Assignments due before beginning of next class)
01/17	02	Data Representation	HW1-C++ Programming
01/24	02 03	Data Representation Computer Organization I: Assembly Programming	HW2-Data Representation
01/31	03	Computer Organization II: Assembly Programming	HW3-Assembly Programming
02/07	03	Computer Organization: Input / Output Mid-Term Exam Review	No HW Due-Prep for Mid-Term Exam
02/14		Mid Term Exams	
02/21	04 05	Operating Systems. Cache Memory	HWweek6 -I/O plus
02/28	05	Cache Memory	HW4-C++
03/07	06	Processes and Scheduling Final Exam Review	HW4B-Cache Memory
			HW5-Process and Scheduling Programming
03/14		Final Exam between 6:00-7:50 pm	

Submission on Canvas

Name your files as yourusernamehw1, yourusernamehw2...

You will submit the written portion of the assignment to the instructor before class on due date.

Submission on CS1 Server

Please make sure that your program compiles and runs giving the expected output. (Use cs1 server, if it does not run on the server you will get a zero).

Submit your Homework program by running

/home/fac/obarej/submit/23wq5041_02/submit02/hw1_submit for homework 1.

Respectively for other homeworks....hw2_submit.... (Name of your program files hw1.cpp, hw2.cpp....)

The following grade scale will be used:

> 93 = A
93 – 90 = A-
90 – 87 = B+
87 – 83 = B
83 – 80 = B-
80 – 77 = C+
77 – 73 = C
73 – 70 = C-
70 – 67 = D+
67 – 63 = D
63 – 60 = D-
< 60 = F

At the discretion of the instructor, the course grading scale may be curved but only to reduce the requirement to receive a particular grade. For example, the requirement to receive an A may be lowered from 93% but cannot be raised to some number higher than 93%.

An agreement to receive an Incomplete (I) grade may be negotiated if your circumstances do not allow you to finish the course on time. The Incomplete Grades Policy of the university is available on the Office of the Registrar web site: <https://www.seattleu.edu/redhawk-axis/academic-policies/>

STUDENT EXPECTATIONS

Assumed Knowledge Expectations:

It is assumed that you are familiar with the following subjects:

- Data Structures: arrays, linked lists, hash tables, and binary search trees

Workload Expectations:

Students are expected to keep up with the course material. This also includes completion of the reading assignments that are posted in the lecture notes. Unless noted otherwise, you are responsible for all assigned material even if a topic was not covered during lecture.

As this is a three credit class, students should plan to spend *at least six hours per week* outside of class. Students who need to learn or review the assumed knowledge topics above and students who are quite new to C++ programming will need to spend even more time.

Students are also responsible for turning in homework in a timely fashion (refer to the Late Homework Policy later in this document) and, unless noted otherwise, to complete assignments individually (refer to the Academic Integrity Policy later in this document).

Class Conduct Expectations:

You are responsible for treating other students with respect and to minimize disruptions to the classroom. Examples of classroom disruptions include, but are not limited to: ringing cell phones, using cell phones and laptops in a distracting manner, arriving to class late, leaving class early, and leaving/reentering the classroom.

In the interest of class safety, please register to receive emergency text messages at <http://www.seattleu.edu/safety/text-messaging>. If you receive an emergency text message during class, please interrupt me as I may not carry my phone to the class.

Class Announcement and Email Expectations:

Students are expected to keep up-to-date on class announcements made outside of class on a *daily* basis. All class announcements will be made in class and/or via Canvas. By default, Canvas will instantly send these announcements to your SU email address. If desired, you may change the settings on Canvas to send these announcements to an alternative email address and/or to social media accounts.

It is also important to check your SU email account on a daily basis as private emails initiated by the instructor could be sent to the student's SU email address. Also, important university announcements (such as the school closing due to inclement weather) are made in this fashion.

Attendance Expectations:

Attendance is strongly encouraged. You are responsible for learning the materials you missed from not attending a class on your own.

In the event of an extended absence such as a prolonged illness, it is your responsibility to make up the missing material and catch-up with the remainder of the class as soon as possible. In this situation, to the best of your abilities, keep in contact with me during the absence and schedule a meeting with me once you are back. If an absence causes you to miss several class periods and assignments that make it very difficult for you to catch-up, you will unfortunately have to withdraw from the course.

In accordance with university policy, incomplete grades (I) are only given if an unexpected extended absence occurs at the end of the quarter.

On exam days, attendance is required. Failure to appear for an exam will result in a score of zero for that exam. Makeup exams will be given only in extraordinary circumstances and the students must provide written documentation to the instructor and reserve a make-up time at least 24 hours in advance.

Academic Resources:

If you need additional help with the course material, the following resources are available to assist:

- Communicating with the instructor via email or during office hours.
- The computer science department provides drop-in tutoring. Some tutors (but not necessarily all) will be able to help with this particular course. A schedule will be posted when it is available (typically during the first two weeks of class).
- Learning Commons (<http://www.seattleu.edu/learningcommons/>) on the 2nd Floor of Lemieux Library provides research services and learning assistance programs.
- Internet (make sure the sources are reputable and that you are not violating the Academic Integrity Policy).

If you have difficulty finding help on a particular topic, please contact the instructor.

COURSE POLICIES

Canceled Class Policy:

If a class is canceled (likely due to inclement weather or instructor illness), the instructor has the right to make up lost class content in an online format.

Lecture Recording Policy:

Lectures are copyright of the instructor. As a student enrolled in the course, you have permission to record audio of the lectures for your personal use only, provided it is not obtrusive to the instructor and/or other students in the class. Recordings may not be publicly disseminated (such as posting on the Internet). For lectures not taught by the instructor, permission to record audio must be explicitly obtained by the guest lecturer.

Videotaping of lectures in any form is prohibited.

Late Homework Policy:

Late homework is not accepted. It is imperative that you start your assignments early. Each assignment will indicate a due date and due time. Assignments turned in after the due time on the due date will receive a zero. Extensions to the due date will only be given in extraordinary situations and are not given for technical problems such as computer failures. If you are having difficulties completing the assignment, it is imperative that you see me *before* the due date. Do not email me your work. No extra credit.

Electronic Submission Policy:

Programming assignments will be required to be submitted electronically on CS1 machine. Submission details will be provided in the assignments. While a solution can be submitted multiple times, only the last submission will be graded as previous submissions are overwritten. Be sure to double-check your solutions as assignments will only be graded once after the due date. For assignments that are required to be submitted electronically, they must be submitted electronically. Assignments submitted using other means, including email submissions, will not be accepted.

Written Homework Submission Policy:

Unless specified otherwise, the only way that you may submit written homework is to hand it directly to the instructor in person either in class or during office hours.

Grading Dispute Policy:

If you feel something was graded incorrectly or a math error occurred when tabulating the total score of an exam or assignment, please contact me. Grading disputes will only be accepted for **one week** that starts when the exam or assignment grade was first available to the student.

Notice Regarding Religious Accommodations

- It is the policy of Seattle University to reasonably accommodate students who, due to the observance of religious holidays, expect to be absent or endure a significant hardship during certain days of their academic course or program. Please see, *Policy on Religious Accommodations for students*

<https://www.seattleu.edu/media/policies/Policy-on-Religious-Accommodations-for-Students---FINAL.pdf>

Disabilities Policy:

If you have, or think you may have, a disability (including an ‘invisible disability’ such as a learning disability, a chronic health problem, or a mental health condition) that interferes with your performance as a student in this class, you are encouraged to arrange support services and/or accommodations through Disabilities Services staff in the Learning Center, Loyola 100, (206) 296-5740. Disability-based adjustments to course expectations can be arranged only through this process.

Academic Integrity Policy:

Students, unless specifically stated otherwise, are required to do all work in this course individually. Submitted work must be original work done by the student. However, you may use class material without citation. Class material includes information that was presented in class, discussed during office hours, that appears in the textbook or lecture notes, or was provided by me

(or any guest instructor). The use of external sources such as other books, open source, or the Internet must be approved by the instructor and must be cited before submitting the assignment.

If you are in doubt whether a particular activity may be considered cheating, ask the instructor. In addition, you are encouraged to consult the Academic Integrity Tutorial available on SU Online (<https://www.seattleu.edu/academicintegrity/>).

Any evidence of plagiarism, collaboration, or other cheating will result in a zero for all parties concerned for the assignment or exam in question. In addition, all academic integrity violations will be reported according to the Seattle University Academic Integrity Policy. That process may enforce additional penalties and/or disciplinary action. Please consult the Academic Integrity Policy (2011-3) for further information.

Academic Policies on the registrar website:

Be sure that you understand the following university academic policies, posted on the Registrar's website (<https://www.seattleu.edu/registrar/academics/performance/>):

- Academic Integrity Policy
- Academic Grading Grievance Policy
- Professional Conduct Policy (only for those professional programs to which it applies)