CSC 373: Computer Systems I

Winter 2020

Sec. 502: TuTh 3:10PM – 4:40PM @ CDM Center 218

Sec. 511: Available TuTh 7:40PM @ Online

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Contents

1   Course specifics

Description.   From the course catalog:

> A course on computer systems topics, focusing on machine-level programming and archi-tecture and their relevance for application programming. Information representations, assembly language, C programming, and debuggers, processor architecture.
> Prerequisites: (CSC 393 or CSC 300) and MAT 140

Prerequisites.   At the beginning of the course, the student is expected to:

- Be familiar with execution control structures (`if`/`else`, `for`, and `while` statements);
- Know how to create, debug, compile and run programs in a general-purpose language;
- Know how to use basic data types and basic data structures (queue, stack);
- Be familiar with basic formal logic.

If the student does not feel comfortable with these topics before the course starts, I very much recommend going through the materials of CSC 300 and MAT 140, redoing some exercises.

Learning outcomes.   At the end of the course, the student will:

1. Have basic C programming skills;
2. Understand how integers, strings, arrays and other structures are represented and manipu-lated at the machine level;
3. Understand how programs are represented at the machine-level;
4. Be able to read, understand, and debug 64-bit Intel Assembly code in AT&T format;
5. Know how to take advantage of the parallelism in modern CPUs to optimize performances.

2   Resources

Reference books.   The main textbook for this class is:

→ *Computer Systems: A Programmer's Perspective, 3rd Edition*, by Bryant & O'Hallaron. (ISBN: 9780134092669)

The book has a companion website that offers extra material and practice exercises:

→ `https://csapp.cs.cmu.edu/`

The main textbook will be complemented, during the first few weeks, with the following textbook:

→ *Programming in C, 4th Edition*, by Kochan. (ISBN: 9780321776419)

Office hours.   Office hours are posted and to be booked on BlueStar. If you need to see me outside these hours, send me an email.

D2L. The course makes use of the D2L platform, and I strongly encourage students to post questions over there. Everybody is welcome to discuss, all the while staying professional and on topic. I will reply to each discussion usually within 24 hours (48 hours during weekends). Likewise, I will use D2L to communicate with the students.

Contacting me by email. When possible, use D2L. If this is not possible, then send me an email *with a subject that contains "CSC 373" and with your real name somewhere.* Emails that do not respect this simple rule will be disregarded.

3   Work expectations and grading

Homework assignments. On Weeks 2, 3, 6, 7 and 9, a homework will be given with one week notice. These consist in reading assignments and short programming problems. The assignments are due on Fridays, 11:42pm.

Lab assignments. On Weeks 4, 8, and 10, a more comprehensive programming assignment, known as a *lab*, will be given with two weeks notice. These are *substantive* assignments, the student *should* start working on them as early as they can. These are also due on Fridays, 11:42pm.

Final numeric grade. The final numeric grade will be computed as follows:

- Homework assignments: 20% (best 4, one discarded)
- Lab assignments: 30%
- Midterm exam: 25%
- Final exam: 25%

Final letter grade. Percentages are converted to letters based on the following table:

Percentage	Letter	Manner of fulfillment
92-100	A	Excellent
90-91	A-	
88-89	B+	
82-87	B	Very Good
80-81	B-	
78-79	C+	

Percentage	Letter	Manner of fulfillment
72-77	C	Satisfactory
70-71	C-	
68-69	D+	
62-67	D	Poor
60-61	D-	
0-59	F	

4   Schedule

Drop dates and the academic calendar at large can be found there:
→ `https://academics.depaul.edu/calendar/Pages/default.aspx`

The following is the week-by-week topic schedule—it is speculative and subject to change. The section number in parenthesis refers to the reference books (BO for Bryant & O'Hallaron's, K for Kochan's).

- Week 1 (01/07): Intro to computer systems, UNIX, and C (BO Ch. 1 & K Ch. 1-5, 7)
- Week 2 (01/14): Machine representation of data (BO Ch. 2 & K Ch. 11)
- Week 3 (01/21): Integer arithmetic (BO Ch. 2 & K Ch. 11)
- Week 4 (01/28): C arrays, strings, pointers, and structures (K Ch. 6, 8-10)
- Week 5 (02/04): MIDTERM + Intro to machine representation of programs (BO Ch. 3)
- Week 6 (02/11): Machine represention of programs (BO Ch. 3)
- Week 7 (02/18): Arithmetic and logical operations; control (BO Ch. 3)
- Week 8 (02/25): Procedures; arrays and pointers; buffer overflow (BO Ch. 3)
- Week 9 (03/03): Optimizing program performance (BO Ch. 5)
- Week 10 (03/10): Optimizing program performance (BO Ch. 5)
- **Sec. 502 Final Exam: 03/17, 2:30pm-4:45pm**

Additionally, each Friday at 11:42pm, starting with 01/17, there will be an assignment to hand out.

CSC 373 Winter 2020

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Jan 2020	6	7	8	9	10	11	12
		15:10 - Class		15:10 - Class	Homework 1		
	13	14	15	16	17	18	19
	Homework 1						
		15:10 - Class		15:10 - Class	Homework 2		
					Lab 1		
	20	21	22	23	24	25	26
	Lab 1						
	Homework 2						
		15:10 - Class		15:10 - Class			
	27	28	29	30	31	1	2
	Lab 1						
		15:10 - Class		15:10 - Class			
Feb 2020	3	4	5	6	7	8	9
		15:10 - Midter		15:10 - Class	Homework 3		
	10	11	12	13	14	15	16
	Homework 3						
		15:10 - Class		15:10 - Class	Homework 4		
					Lab 2		
	17	18	19	20	21	22	23
	Lab 2						
	Homework 4						
		15:10 - Class		15:10 - Class			
	24	25	26	27	28	29	1
	Lab 2						
		15:10 - Class		15:10 - Class	Homework 5		
					Lab 3		
Mar 2020	2	3	4	5	6	7	8
	Lab 3						
	Homework 5						
		15:10 - Class		15:10 - Class			
	9	10	11	12	13	14	15
	Lab 3						
		15:10 - Class		15:10 - Class			
	16	17	18	19	20	21	22
		14:30 - Final					

5   Attendance

I will not be taking attendance after the first class and the final grade is not impacted by attendance. Students joining the class are expected to remain for the whole duration. Students will not be allowed in class if more than 15 minutes late.

6   In-person Proctored Exams for OL courses

If you are an online learning student living in the Chicagoland area (within 30 miles of Chicago), you will need to come to one of DePaul's campuses to take an exam. Online learning students outside of the Chicagoland area are required to locate a proctor at a local library, college or university. You will need to take the exam within the window your instructor gives. Students should examine the course syllabus to find exam dates and the instructor's policy on make-up exams. Detailed information on proctored exams for online learning students can be found at

→ `https://www.cdm.depaul.edu/onlinelearning/Pages/Exams.aspx`

7 University policies

7.1 Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L and sent via email.

7.2 Online Course Evaluations

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online in CampusConnect.

7.3 Academic Integrity and Plagiarism

This course will be subject to the university's academic integrity policy. More information can be found at
→ `http://academicintegrity.depaul.edu/`
If you have any questions be sure to consult with your professor.

7.4 Academic Policies

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the University Academic Calendar. Information on enrollment, withdrawal, grading and incompletes can be found at
→ `http://www.cdm.depaul.edu/Current%20Students/Pages/PoliciesandProcedures.aspx`

7.5 Incomplete Grades

An incomplete grade is a special, temporary grade that may be assigned by an instructor when unforeseeable circumstances prevent a student from completing course requirements by the end of the term and when otherwise the student had a record of satisfactory progress in the course. All incomplete requests must be approved by the instructor of the course and a CDM Associate Dean. Only exceptions cases will receive such approval. Information about the Incomplete Grades policy can be found at
→ `http://www.cdm.depaul.edu/Current%20Students/Pages/Grading-Policies.aspx`

7.6 Preferred Name & Gender Pronouns

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter so that I may make appropriate changes to my records. Please also note that students may choose to identify within the University community with a preferred first name that differs from their legal name and may also update their gender. The preferred first name will appear in University related systems and documents except where the use of the legal name is necessitated or required by University business or legal need. For more information and instructions on how to do so, please see the Student Preferred Name and Gender Policy at
→ `http://policies.depaul.edu/policy/policy.aspx?pid=332`

7.7   Students with Disabilities

Students seeking disability-related accommodations are required to register with DePaul's Center for Students with Disabilities (CSD) enabling them to access accommodations and support services to assist with their success. There are two office locations:

- Loop Campus – Lewis Center #1420 – (312) 362-8002
- Lincoln Park Campus – Student Center #370 – (773) 325-1677

Students who register with the Center for Students with Disabilities are also invited to contact Dr. Gergory Moorhead, Director of the Center, privately to discuss how he may assist in facilitating the accommodations to be used in a course. This is best done early in the term. The conversation will remain confidential to the extent possible. Please see the following link for Services and Contact Information:

→ `https://offices.depaul.edu/student-affairs/about/departments/Pages/csd.aspx`

7.8   Attitude

A professional and academic attitude is expected throughout this course. Measurable examples of non-academic or unprofessional attitude include but are not limited to: talking to others when the instructor is speaking, mocking another's opinion, cell phones ringing, emailing, texting or using the internet whether on a phone or computer. If any issues arise a student may be asked to leave the classroom. The professor will work with the Dean of Students Office to navigate such student issues.

7.9   Cell Phones/On Call

If you bring a cell phone to class, it must be off or set to a silent mode. Should you need to answer a call during class, students must leave the room in an undisruptive manner. Out of respect to fellow students and the professor, texting is never allowable in class. If you are required to be on call as part of your job, please advise me at the start of the course