

Spring 2020

## CS 350-002: Introduction to Computer Systems (Revised for Remote Learning)

Andrew Sohn

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# CS350 Intro Computer Systems - Syllabus for Spring 2020

Andrew Sohn, Computer Science Department

**Tues, 4/21/2020**

## List of changes due to COVID-19 and online Webex-based lectures since the announcement of class cancellation on 3/12/2020:

- Test 2 that was originally scheduled on Thur, 4/2/2020 was held on Thur, 4/9/2020 as students were not prepared due to this sudden and drastic change.
- Homework due dates have been extended multiple times. Homework 10 is dropped to lessen the burden on students.
- Lecture schedule has also been changed since week8 (when this crisis happened). Lectures of weeks 8 to 11 have been given more time to make up for the loss due to school closing. To make room for this extended discussion, two lectures on Ch.9 Virtual memory - the last topic of course on last week - were dropped.

· **Class Web page:** <http://web.njit.edu/~sohna/cs350>

### · **Instructors**

- Section 002: Andrew Sohn, GITC 4209, (973)596-2315, email: sohna\_at\_njit\_dot\_edu  
Office hours Tue 10:30-11:30 am, Thur 2:30-3:30 pm, by appointment
- Section 004: Mehtab Sidhu, GITC nnnn, email: mss87\_at\_njit\_dot\_edu, office hours M,W 1-2:15 pm, GITC 4324.
- You can visit any of us during the office hours, including TA, the two graders and recitation leaders. If you are unable to make any of our office hours, send us email for an appointment.
- While in my office asking for help on the course, do not check/answer your cell phone. If you have to check/answer your phone, I ask you to leave my office and do so outside.
- I do not check/answer my cell phone while trying to help you. I ask you to do the same.

### · **TA/Graders:**

- TA: Yongjian Wang yw662\_at\_njit\_dot\_edu, Office hours and location: M 11 am-noon, F 3:30-4:40 pm. Office location TBA. Send him email in the mean time for location.
- Recitation leader: Daniel Drechsel ddd9\_at\_njit\_dot\_edu
  - § Recitation: Mon 2:30-4:00 pm, location CKB 120
  - § Office Hours: Wed 11:30-12:30, location: GITC 4325
- Recitation leader: Philip Poretsky ptp24\_at\_njit\_dot\_edu
  - § Recitation: Fri 10:00-11:30 pm, location CKB 303
  - § Office Hours: Fri 2:30-3:30, location: GITC 4422

- **Class time and location:** See the registrar's page <https://uisnetpr01.njit.edu/courseschedule>
- **Textbooks - required - strongly suggest to get a real book, you will find useful in your computing career:**
  - Computer Systems: A Programmer's Perspective, 3/E (CS:APP3e), Randal E. Bryant and David R. O'Hallaron, Pearson (July 6, 2015), ISBN-13: 978-0134123837, ISBN-10: 0134123832.  
See <http://csapp.cs.cmu.edu/3e/home.html> for lecture notes.
  - The C Programming Language, Kernighan and Ritchie, Prentice Hall, 2nd ed., ISBN: 978-0131103627, and a Bash book of your choice.
- **Platform:** Linux and C. You need access to a Linux box for this course. Either use the school's Linux boxes or install a virtual machine with Fedora/Ubuntu/Debian or a choice of your own Linux distro. It's best if you get your machine multibooted along with your native OS such as windows or mac.
- **Grading:**
  - Weekly homework and programming assignments (10%)
  - Test 1 (25%), Thur, 2/20/2020, for an hour and 15 mins, the same classroom
  - Test 2 (25%), Thur, 4/9/2020, for an hour and 15 mins, the same classroom
  - Final exam (36%) - See the registrar's page for date, time and location.
  - **4% will be given to everyone, due to reduction of 40% final to 36%, as ordered by the University (5/4/2020).**
- **Homework:**
  - Submit your homework at canvas: <http://canvas.njit.edu>
  - Homework is due at 11:59 pm of the posted due date.
  - Homework will not be accepted after the due date. Submit on time. Do not ask for exceptions. If you ask for an exception, I will apply that to everyone in class.
  - Exam questions are based on homework/programming assignments. Do your homework from scratch and on your own. Be prepared to spend an hour to two a day on homework.
  - Homework must be your own work. Do not show your code and/or copy other's code.
  - Copying homework will be referred to the University for disciplinary actions.
- **NJIT policy on recording class materials:** You may not record anything in class in any form with any device. You may not put any video/audio recorded class materials on the Web/Internet. You are breaking the policy.

· **Social network-related:** I do not join social network. Requests to join will not be answered. Once your info is out, it will be out there forever. You will not be able to take it back. Do it at your own risk. Read the Time magazine article "I helped create this mess. Here's how to fix it," published 1/28/2019.

· **Exam related. Read carefully:**

- **Procedure for exams:** An hour or two before the exam, you will receive an email regarding seating assignment based on NJIT ID number. Make sure to take a seat according to the seating assignment. *Numbered exams will be distributed to matching seats.* Make sure your numbered exam paper matches your seat assignment. Leave your NJIT ID card on the table. IDs will be checked during the exam. Do not take someone else's exam paper. You both are taking someone else's exam.
- **Disagreement with exam marking/scores:** If you disagree with your exam scores/marks, you may dispute within a week of receiving the graded exam paper. After a week, no exams will be contested.
- **Grading dispute:** If you disagree with your grade, you may contest after the first school day but within a week of the following semester. After a week of the first school day of the following semester, no grading dispute will be considered.
- **NJIT policy on missed exams:** There will be no make-up exam(s). You must plan your semester accordingly. Should you miss the exam(s) due to emergency, (a) go to the Dean of students, (b) explain your situation as to why you had to miss, and (c) ask to issue a memo to me. If and when I receive a memo from the Dean on your missed exam, I will copy your next exam score to the missing one. Those who miss the final exam will fail in the course unless you demonstrate a true emergency again through the office of the Dean of students. No other policy will be applied. Do not ask for an exception. No exceptions will be made.
- The sample midterm and final exams sent out last semester(s) will be out there somewhere. Check the Web for the sample exams. Sample exams are for your reference only. Actual exams can be similar or completely different. Do not rely on the sample exams for your exam preparation.

· **Email Policy: I read email and respond between 9 am to 5 pm, Monday through Friday.**

- **I do not intentionally own a smart phone, hence have no means to read and respond emails on-the-go.**
- I will try to respond within 24 hours. In most cases, I respond sooner than 24 hours. However, often times there are situations where I may not be able to respond to your email within 24 hours due to travelling, health, inclement weather, etc, in which case your patience is appreciated.
- I appreciate emails that are concise, short, to the point. You don't need to write profuse pleasantaries, thanking in anticipation of my replies, finding your programming bugs, etc. while I understand you want to be courteous. Emails of half to a page containing programming questions, in particular assemblies, will take sometime even days for me to respond as I have to read

carefully and actually execute to make sure you get useful comments from me. I will answer as soon as I can but not within hours as I have no smart phone to read and respond on-the-go. You are encouraged to send questions to the three TAs.

- Note that you'll get no response if you ask questions that are answered on this page, such as office hours, locations, TA names, their hours, exam dates and locations, the URL of lecture notes, etc.

- You are required to read the NJIT Policy on Academic Integrity for this course:

<https://www.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>

### Modified weekly lecture schedule

See <http://csapp.cs.cmu.edu/3e/home.html> for lecture notes.

Week	Chapter	Lecture	Section	Homework
1	Ch.1 Computer Systems	1	About the course	
		2	Intro to computers	<a href="#">HW1 on reality</a>
2	Ch.2 Representing and	3	Binary, octal, decimal, hexa numbers, integer representation	
		4	Binary to integer to unsigned and back	
3	Manipulating Information	5	Integer addition, integer multiplication	<a href="#">HW 2 on ints</a>
		6	Floating point representation and operations	
4		7	Data types, registers, C to assembly to machine code	<a href="#">HW 3 on floats</a>
		8	Data movement instructions, address computation	
5	Ch.3 Machine-Level Representation of Programs - Linux assembly and machine languages	9	Data movement instructions, address computation	
		<b>10</b>	<b>Test 1, for an hour and 15 mins, the same classroom</b>	
6		11	Control: jump instructions, conditional branches	<a href="#">HW 4 on basic assembly</a>
		12	Loops and switch statements, push, pop	
7		13	Procedures and recursions	<a href="#">HW 5 on control</a>
		14	Array allocation and access, pointers	
8		15,16	Multi-dimension arrays, matrix, structs,	
		16,17,18	Stack overflow detection and prevention, variable stack	<a href="#">HW 6 on procs, recurs</a>

9		18,19	Floating point instructions using mmx...zmm registers, avx,sse	
9	Ch.4 Processor Architecture	19	Sequential computers - instruction set, add, mov	
10		20,21	Sequential computers - add, mov, load, store	<a href="#">HW 7 on stack overflow</a>
		<b>22</b>	<b>Test 2, for an hour and 30 mins, Canvas</b>	
12		23,24	Sequential computers - load, store, push, pop, call, ret	
		24,25	Pipelined computers - data and branch hazards	<a href="#">HW 8 on instr exec</a>
13		26	Pipelined computers - solutions to the hazards	
13	Ch.6 Memory Hierarchy	26	Main memory, cache memory, locality of reference	
14		27	Cache memory - mapping, placement	<a href="#">HW 9 on issues</a>
		28	Cache memory - placement, replacement, memory mountain	