CS 381 – Fall 2021

Week 1, Lecture1

Part 1

CS 381, Spring 2021

Two sections

- LE1: Simina Branzei, M/W/F, 1:30 pm – 2:30 pm BRNG 2280
- LE2: Alex Psomas, Tue/Thu, 10:30 - 11:45, WALC 3087

Technology:

- Brightspace for common assignments, quizzes and exams
- Piazza for questions and discussions
- Gradescope for assignment submissions and grading

Overview of Weekly Structure

Monday/Wednesday/Friday

- Lectures in class. Slides posted the same day.

Weekly quiz (see syllabus and later slides)

PSOs

- Tue: 11:30 - 12:20 BRNG B268, with Abhi & Nithish
- Tue: 1:30 - 2:20 WALC 3127, with Aniket & Nicholas
- Thu: 2:30 - 3:20 REC 108, with Vijay & Qiyang

Brightspace

- Course syllabus, lectures, videos, assignments, grades, etc.
- Quizzes taken on Brightspace
- Read the 381 syllabus carefully (more than once)

Piazza

- For discussion and communication
- Sign up!

Course policies are subject to change as university/college/ departmental policies change

Gradescope

- Submitting typed assignments, view graded work
- Written exams (MC questions may be done on Brightspace)

Zoom

- Office hours on Wednesdays 2:30 – 4:00PM. Link https://purdue-edu.zoom.us/j/97408207893?pwd=a0tLbng0enBja0JuKzlsNUUyT2FsUT09

Prerequisites for 381

- **CS 182**
  - Knowledge of discrete math used in CS
  - Proof techniques: direct, indirect, induction
  - Abstractions, recursion, counting
- **CS 251**
  - Understanding data structures: their use, implementations, performance, limitations, tradeoffs
  - Basic algorithm knowledge
  - Programming skill allowing you to judge and think through an implementation without coding

More on prerequisites

- **Data structures**
  - Stacks, queues, search trees (binary, balanced), priority queues (heaps), hashing, trees, graphs
  - Common operations on data structures under different implementations
- **Algorithms**
  - Searching and sorting
  - Graph and tree traversals (BFS, DFS, pre, post, inorder)
  - Computing simple graph properties
  - Examples of greedy algorithms: Shortest path, min spanning tree
  - Analyze asymptotic performance of code segments

Algorithms are Central to all of Computer Science

CS381 focuses on ***problem solving*** and ***computational limitations***:

- Study and exploration of techniques for solving problems efficiently and demonstrating computational limitations.
- Developing creative, efficient, and correct solutions.
- Abstracting problems from application scenarios and extracting essential features impacting performance.
- Analyzing an algorithm's performance in a machine and language independent way.
- Developing mathematical and analytical problem solving skills.

Course Personnel

Instructor

- Professor Simina Branzei and Alex Psomas

Graduate TAs

- Rohan Garg (Head GTA)
- Nicholas Recker (Head GTA)
- Michael E. Beshear
- Qiyang He
- Negin Karisani
- Nithish Kumar

Undergraduate TAs

- David Kim (head UTA)
- Andrew Hou (head UTA)
- Vijay Bharadwaj Ian Ryan
- Abhishek Gunasekar
- Karmenyae Khurana
- Rewati Shitole
- Aniket Kumar Gupta

TA assignments subject to change.
See Brightspace for final list and office hours

Coursework

- **Weekly quizzes:** 25%
  - Multiple choice on Brightspace
- **Assignments:** 25%
  - 6-8 typed assignments uploaded to Gradescope
- **Participation:** 5%
  - working with your study group; questions are asked in your study group before asking the Tas and instructors
  - answering Piazza questions
- **Midterm Exam:** 20%
- **Final exam:** 25%

Check syllabus for more details.

Coursework

Study groups:

- **Each student must find a study group of size 2-3 and write it in homework 0.** Groups must be formed by Monday Aug 30 – **start now!** If you need help you can post on a Piazza thread that you are looking for a group, describe your background briefly.
- The study group is for studying together the material, asking questions, solving practice problems or getting help on homework, studying for exams.
- Questions about the material should be asked first in the study group. Only afterwards bring them up to the TA and instructors.

Check syllabus for more details.

About Quizzes

- Weekly **multiple-choice quizzes** review recent material covered in class
- There will be 11-13 quizzes taken on Brightspace.
- Quizzes are open Friday 8am ET - Saturday 7:59am ET. Once started, you have 60 minutes to complete the quiz.
- Quiz questions are drawn from question pools and questions within a pool are considered equivalent.
- One retake is allowed and the better score counts.

First quiz: Review of 182 and 251 material

About Assignments

1. What you submit for grading needs to be understandable and typed in Latex.
2. Some problems will be easier - testing understanding - and some will be more challenging and test creativity
3. Late policy (this semester)
4. Academic Honesty

1. Presenting your assignment solutions

- What you submit needs to be readable and understandable
- A code/code-like solution is not accepted by itself
- If you feel you need to code up an algorithm to be sure, you may not be ready for 381
- We grade for correctness, clarity, conciseness, rigor, and efficiency
- Type using any software supporting math notations (good opportunity to learn Latex for students interested in research)
- Read homework guidelines in syllabus

2. Cannot solve a harder problem?

Partial Credit

- Clearly identify a reasonable approach to solve the problem
- Maximize partial credit by identifying gaps in your attempted solution

Better to acknowledge that you don't know than to pretend you solved it.

- 10% credit for simply admitting "I could not solve the problem"
- Can receive 0% credit for bad/obfuscated "solutions"

3. Late assignments

- Managing your time well is crucial
  - Starting to work on an assignment 2 days before the due date is a failing strategy
- Less than 24 hours late
  - 15% point penalty (out of total points)
  - Subtracted from final score
- 24 to 48 hours late
  - 30% point penalty (out of total points)
  - Subtracted from final score
- More than 2 days late
  - No credit (no submission possible)

4. Academic Honesty

- What is graded in an assignment needs to be expressed entirely in your own words.
- Collaborations is allowed, but you must acknowledge collaborators and resources in each assignment problem
  - Don't cheat yourself out of learning how to solve problems!
  - Suggestion: spend at least 15 minutes thinking about each problem yourself before collaborating
- Reference all sources used
- Failure to acknowledge a collaborator or key source used is cheating.
- Be prepared to explain your solutions to us!

Cheating Penalties

- A first instance of academic dishonesty on an assignment will result in a zero for that assignment plus a letter grade deduction at the end of the semester.
  A second instance of academic dishonesty will result in a course grade of F.
- A first instance of academic dishonesty on an exam will result in a course grade of F.
- In accordance with the Purdue University Department of Computer Science Academic Integrity Policy, any instance of academic dishonesty will be reported to the Dean of Students Office.

About Copyright

- My lectures and course materials, including slides, tests, and other course materials, are protected by copyright.
  - I am the owner of the copyright in the materials I create.
  - CLRS/KT/W/… are the owners of the material I use from slides they provide.
- You may make copies of course materials for your own use.
- You may not and may not allow others to reproduce or distribute lecture notes and course materials publicly without my written consent.
- Similarly, you own copyright in your answers to assignments.
  - If we are interested in posting your answer as a sample solution, we will ask for your written permission.

About the exams

- The midterm and final exam are comprehensive exams (i.e., each exam covers material from begin of the semester up to the exam).
- The in-person exams are completed on paper (exams scanned and uploaded to Gradescope).
- The online exams are taken on Gradescope (entering answers into Gradescope)
- All exams are closed book and closed notes. The use of electronic devices is not allowed and is considered cheating.
- You are allowed to use one (double sided) page of handwritten or typed notes.
- Midterm for LE1: **TBD**

PSOs

No PSOs in week 1

- 5 in-person PSOs
- 2 virtual PSOs
  - Wednesday 4:30-5:20 ET, Thursday 10:30-11:20 ET
  - Links will posted later in the week
- PSO are run by UTAs
- PSOs solve problems. You master 381 material by solving problems.
- PSOs are not recorded. Material covered will be posted.

Piazza Rules of Conduct

- Piazza is intended for clarification of questions and discussion of general interest.
- Piazza cannot be used to post answers to assignments, detailed descriptions of solutions, or hints.
- Piazza is not the forum for complaints about an assignment, exam, or the class.
  - Any concerns should be brought to the attention of the instructor.
- Be courteous and professional when posting/emailing and use appropriate language.
- If you are not sure whether a posting is appropriate, make sure it is made private or e-mail us.

Your tasks

- Read the course syllabus (on Brightspace and Piazza)
- Sign up on Piazza - piazza.com/purdue/spring2021/cs381
- Reading: *Introduction to Algorithms*, T. Cormen, C. Leiserson, R. Rivest, C. Stein, 2009 (CLRS)
  - Section 3.2 (standard notations and common functions)
  - Sections 10 and 12 (data structures)
  - Appendices A, B, C.1 (discrete math)

Coming up

- **Assignment 0** will be due Monday August 30. More details soon. Includes stating your study group – start searching for one now.

- **Quiz 1** is on Friday, August 27
  - 182 and 251 review of fundamentals
  - Review of basic counting and data structures

See course syllabus for more detail