

CS 375 Logic & Theory of Computing

Syllabus

(Fall 2026)

Required/Elective: required

**Prerequisites: MA113, CS215,
CS275**

Syllabus (Fall 2026)

General Information

Topics Covered

Policies

Course Summary & Program Outcomes

Plagiarism & Cheating

Important Links

Important Dates

General Information

You don't need to wear a **mask** to attend this class.

But for your own sake, please do.

Slone Science Building

General Information

Location: SRB*, Rm 303 LEC

Time: TR 9:30 – 10:45am

Instructor: Dr. Fuhua (Frank) Cheng

OFFICE: DMB 303

OFFICE HOURS: TR 11:00am-12:00pm

PHONE: (859) 257-6760

E-MAIL: cheng@cs.uky.edu

General Information

CLASS WEBSITE:

<https://www.cs.uky.edu/~cheng/cs375/CS375-HomePage-2026f.htm>

Or, go to my personal WEBSITE:

<https://www.cs.uky.edu/~cheng/>

Then scroll down to 'Teaching' and click on
'CS375-2026f'

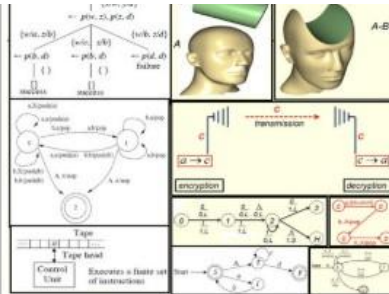
Class website:

CS375: Logic and Theory of Computing (Spring 2026)

Lecture Notes

Will be followed in the following order.

- Preliminaries
 - Regular Languages and Finite Automata-I
 - Regular Languages and Finite Automata-II
 - Regular Languages and Finite Automata-III
 - Regular Languages and Finite Automata-IV
 - Context-free Languages and Pushdown Automata-I
 - Context-free Languages and Pushdown Automata-II
 - Context-free Languages and Pushdown Automata-III
 - Context-free Languages and Pushdown Automata-IV
 - Context-free Languages and Pushdown Automata-V
 - Turing Machines & Equivalent Models-I
 - Turing Machines & Equivalent Models-II
 - Turing Machines & Equivalent Models-III
- (if time permits, then)
- Propositional Logic I II
 - Predicate Logic I II III
 - Computational Logic I II
 - Algebraic Structure



This is the home page of CS375:
Logic and Theory of Computing

Instructor:
Dr. Fuhua (Frank) Cheng
cheng@cs.uky.edu

In this course, the students will learn about basic models of computation based on finite automata, grammars and Turing

machines. Specific skills as outcomes of the course include: (1) A fluency in the elements of automata theory, regular grammars and regular expressions, and their uses; (2) An understanding of the relationship between formal models of computation and modern computers; (3) An understanding of the relevance of theory of computation to the computer science curriculum; (4) An ability to apply knowledge of computing and mathematics appropriate to the discipline; (5) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

The course **syllabus** is available in [ppt format](#) and [HTML format](#).

[Campus resources](#), including [engineering tutoring](#), [UK Counseling Center](#) and [Center for Support and Intervention](#), you can use (for free).

See [Title IV Regulation](#) here.

Homework Assignments

Homework Solution Sets

Exam dates:

- Midterm date: March 11, 2026 (Wednesday)
- Final Exam date & time: 1-3pm, May 6, 2026 (Wednesday)

 Link to [UK Canvas](#)

 Review sheet for
Midterm

 Review sheet for
Final

 Midterm Exam
Solution Set

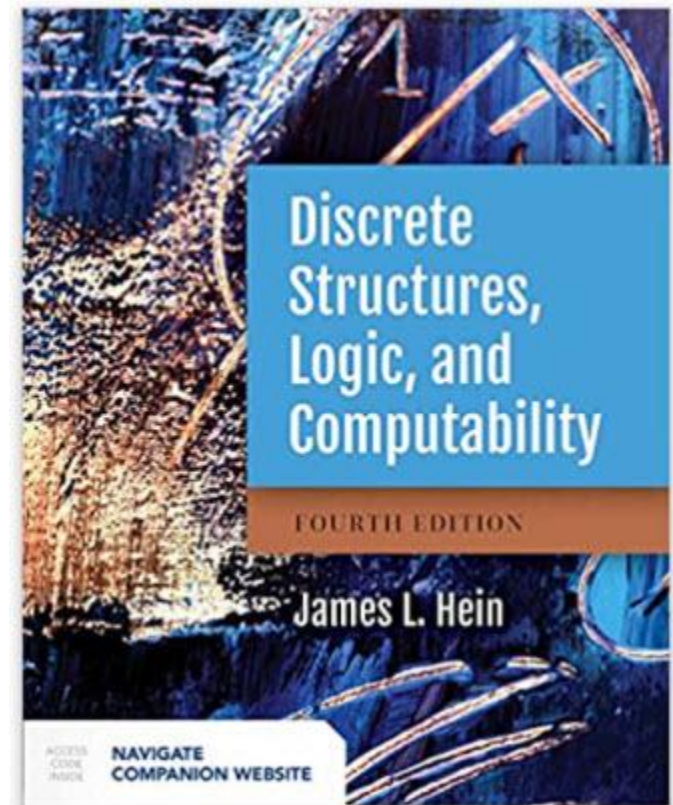
 Final Exam Solution
Set

General Information

TEXTBOOK: Discrete Structures, Logic and Computability (4th Edition)

by James L Hein

and my notes (can be downloaded from the class website)



General Information

TA/Grader:

Ben Wells (ben.wells@uky.edu)

Office hours: W 4pm – 5pm

Office: EE Annex Building Rm 205

List of Topics:

Week 1:

Preliminaries: set algebra, relations, functions
read Chapters 1 - 4

Weeks 2-5:

Regular languages, finite automata
Chapter 11

Week 6-8:

Context-free languages, pushdown automata
Chapter 12

List of Topics:

Weeks 9-11:

Turing machines – Chapter 13

Week 12:

Propositional logic & predicate logic

Chapters 6-7

Weeks 13:

Computing with logic & algebraic structures

Chapters 9-10

Policies:

8-10 Homework Assignments (posted on class website)

HW should be submitted to Canvas both as a pdf file and a doc file on or before the due date

Late work will not be accepted.

Worst HW grade will be dropped when we compute your final grade for this class.

Policies:

All class materials will be available on class website

Send me an email on Friday if you did not receive any emails from me by then.

Policies:

Homeworks---- 40%

Midterm ----- 30%

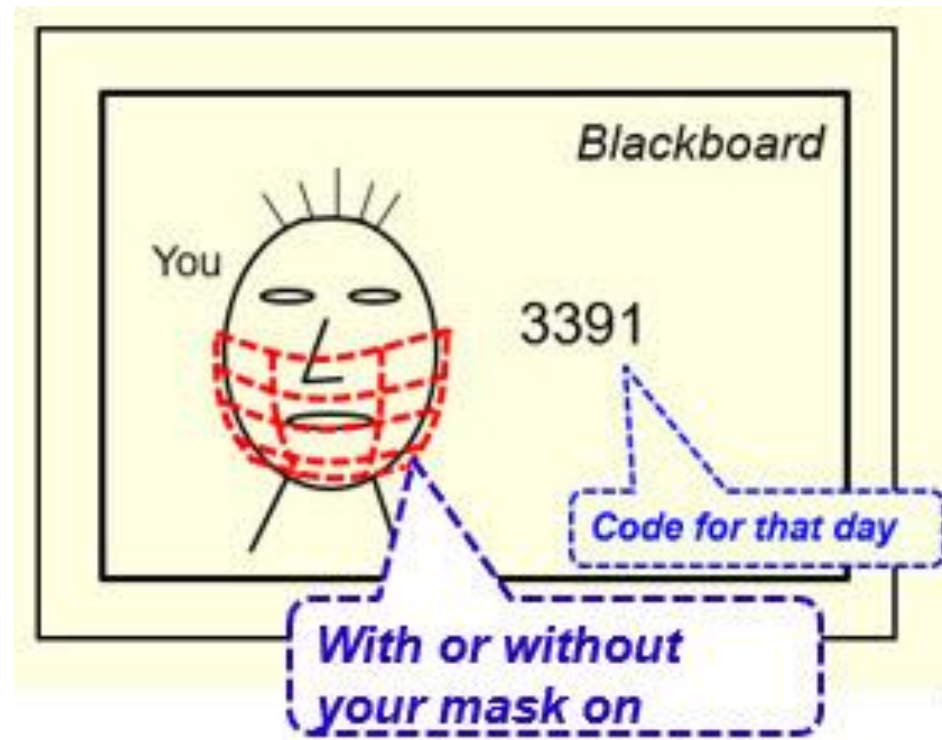
Final (not comprehensive) ----- 30%

Class attendance (extra credit) ----- 5%

- You get the attendance credit (5 extra points) if you miss at most two lectures the entire semester

Attendance checking:

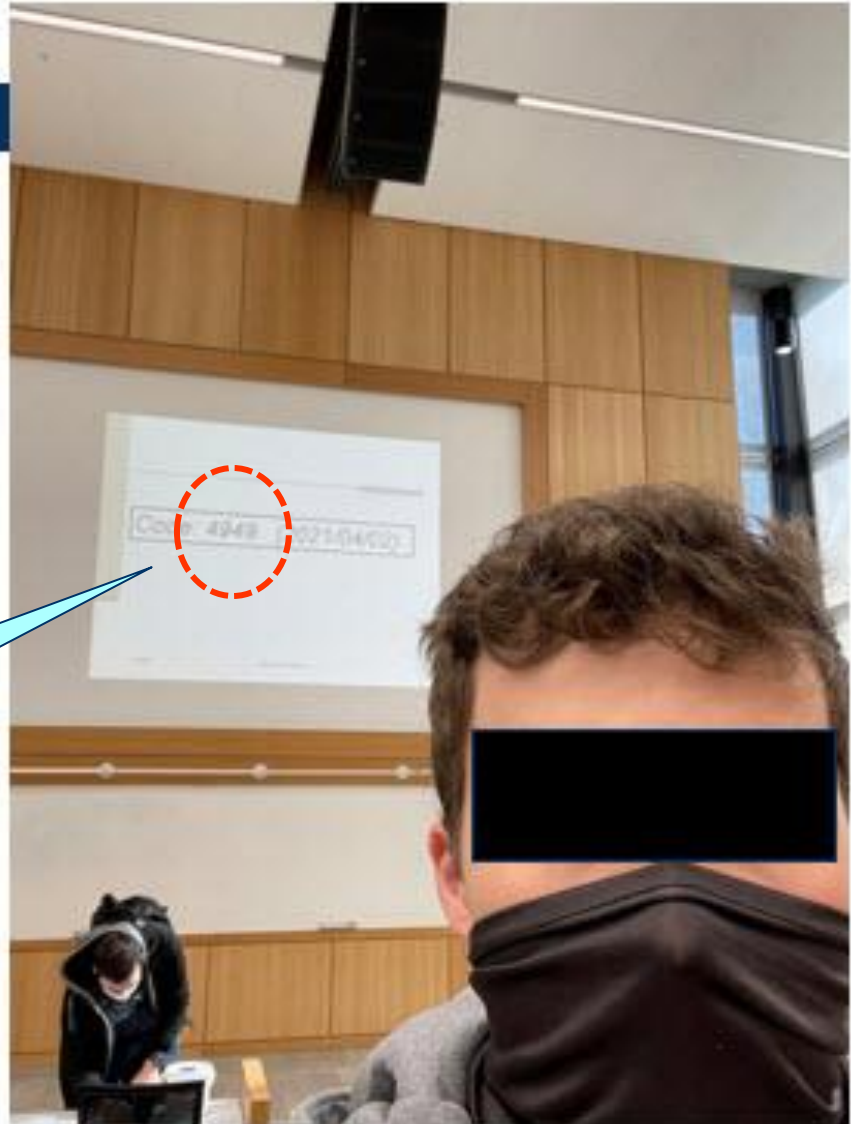
- At the end of each class, a 4-bit special code will be displayed on the board
- Use your cell phone to take a picture of yourself and the code



Attendance checking:

- A real example

Code for that
day



Attendance checking:

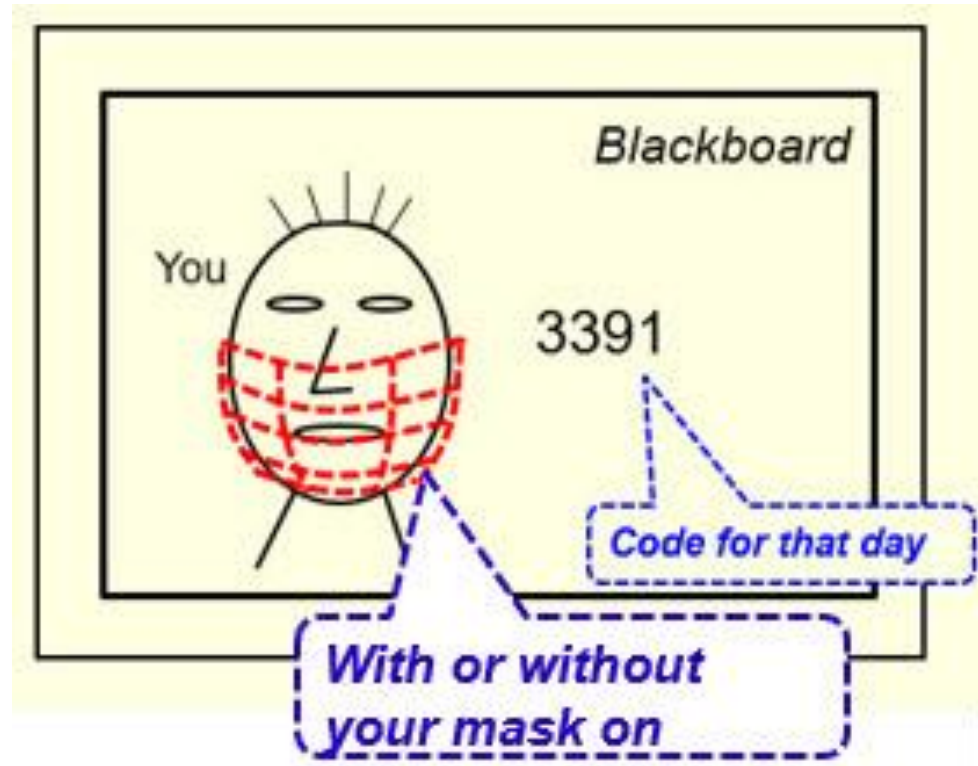
- When you take the picture of the code and yourself, be careful not to include other people in the photo

Don't include other people in your photo



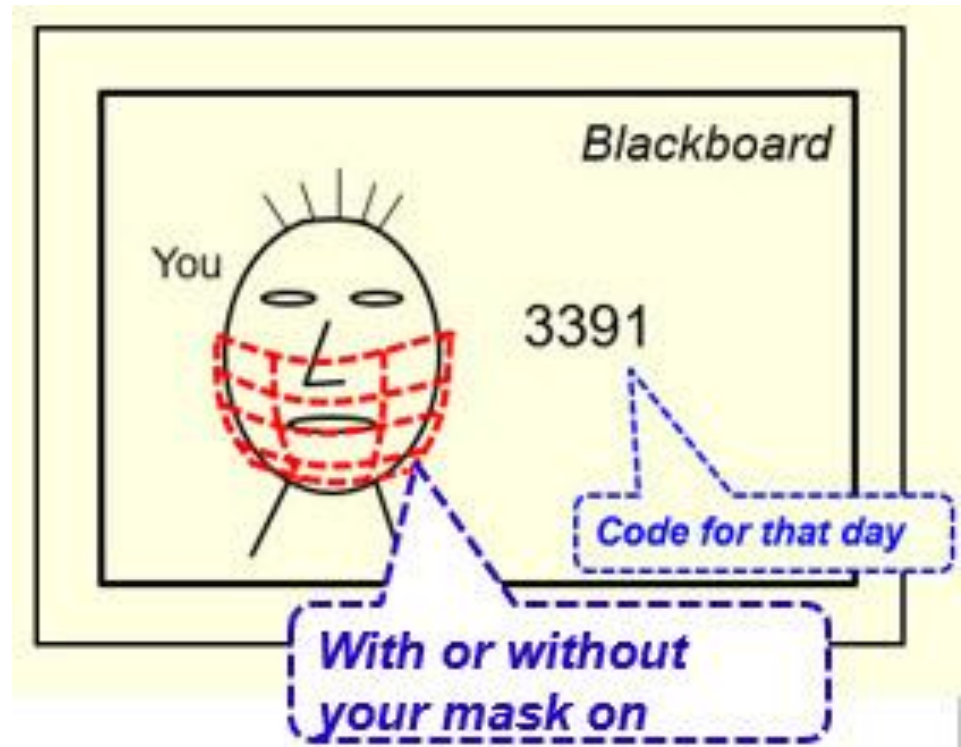
Attendance checking:

- Then submit your photo to Canvas as a proof of your attendance for that day
- Submit your photo to the '**class attendance**' assignment for that day, not a **homework assignment**



Attendance checking:

- When you submit your photo, choose the '**small**' option for the photo size
- This will scale the size down from **2-3 MB** to **20-40 KB** only



Attendance checking:

- Another option is to come to the podium to sign the sign-in sheet if you did not bring your cell phone that day

Sign the sign-in sheet
if forget to bring cell
phone



Scale (after rounding):

90 - 105 A

80 - 89 B

70 - 79 C

60 - 69 D

0 - 59 E

Course Summary & Program Outcomes:

Specific skills to be developed in this class:

- A fluency in automata theory, regular grammars and regular expressions and their uses
- An understanding of the relationship between formal models of computation and modern computers
- An understanding of the relevance of logic and theory of computation to the computer science curriculum

Plagiarism & Cheating:

You are allowed to **discuss ideas** and to help others by **explaining concepts** and **possible solutions**.

You may use online tools such as **ChatGPT** to help your work if you find it helpful.

However, **all work that is submitted must be prepared by yourself**.

Plagiarism & Cheating:

Consult the following links for information on what constitutes an academic offense and on applicable penalties:

<http://www.uky.edu/Ombud/>

<http://www.uky.edu/Ombud/Plagiarism.pdf>

Important Links:

- ❖ UK Academic Policy Statement
- ❖ UK Resources Available to Students
- ❖ Accommodations for Students with Disabilities
- ❖ Accommodations for Religious Observances

Important Dates:

First day of class - 08/25/2026 (Tuesday)

Last day to withdraw without a W or change grading option - 09/11/2026 (Friday)

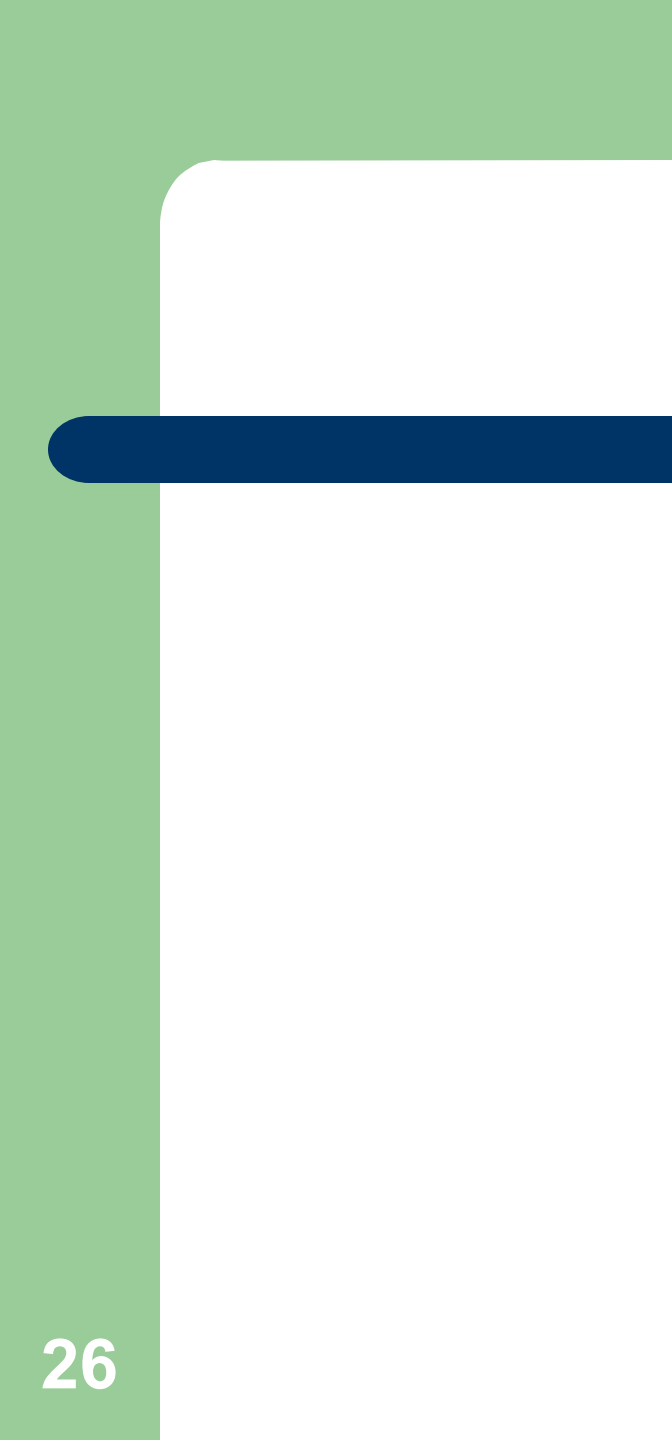
Midterm - 10/20/2026 (Tuesday)

Fall break - 10/26/2026 – 10/27/2026 (M&T)

Thanksgiving break - 11/25/2026 – 11/28/2026 (W – Sa)

Last day of class - 12/08/2026 (Tuesday)

Final Exam - 12/15/2026 (Tuesday 8:00 – 10:00a)



End