

COMP SCI 240 section 001 Syllabus

Introduction to Discrete Mathematics

COURSE INFORMATION

Course Information:

Introduction to Discrete Mathematics

COMP SCI 240 001 (3 Credits)

2023 Fall [1242]

Description

Basic concepts of logic, sets, partial order and other relations, and functions. Basic concepts of mathematics (definitions, proofs, sets, functions, and relations) with a focus on discrete structures: integers, bits, strings, trees, and graphs. Propositional logic, Boolean algebra, and predicate logic. Mathematical induction and recursion. Invariants and algorithmic correctness. Recurrences and asymptotic growth analysis. Fundamentals of counting.

Prerequisite(s)

MATH 217, 221, or 275

Breadth

N - Natural Science

Instruction Mode

Classroom Instruction

Section Level Com B

False

Department: Computer Sciences


College: Letters and Science

Meeting Time and Location:



2023 Fall [1242]

Term Start Date: Monday, 21-Aug-2023 **Term End Date:** Friday, 29-Dec-2023

 [ADD TO CALENDAR](#)

Location and Schedule: Engineering Hall 1800 MWF 9:55 AM-10:45 AM

CRN: 353821242

Instructor Information:

Instructor



Beck Hasti

✉ HASTI@CS.WISC.EDU

Instructor Availability and Preferred Contact:

Office hours (*tentatively*):

- Tuesday 9:00 - 11:00 am
- Wednesday 2:30 - 3:30 pm
- Friday 11:30 am - 12:30 pm
- *and by appointment*

Unless otherwise noted, office hours are held in 5360 CS.

TA Availability and Preferred Contact :





TA office hours are determined in the first two weeks of classes. Once they are determined, they will be posted on Canvas.

How Credit Hours are Met:

How Credit Hours are Met

This class meets for three 50-minute class periods each week over the semester and carries the expectation that students will work on course learning activities (reading, writing, problem sets, studying, etc) for about 2 hours out of classroom for every class period. The syllabus includes additional information about meeting times and expectations for student work.

Course Learning Outcomes (CLOs):

-  Be able to construct proofs by induction to prove properties in a variety of domains (mathematical formulas, recursively-defined structures, loop invariants, correctness of recursive programs).
-  Apply basic combinatoric techniques to counting problems.
-  Develop basic skills to construct mathematically rigorous arguments and proofs.
-  Gain exposure to the basics of program analysis (program correctness, recurrences, asymptotic analysis).

INSTRUCTOR to STUDENT COMMUNICATION

Course Overview:

Lectures

- **Lecture 1:** 1800 Engineering Hall, MWF: 9:55 am - 10:45 am
- **Lecture 2:** S413 Chemistry, MWF: 1:20 pm - 2:10 pm

URLs (in addition to Canvas)

- piazza.com/wisc/fall2023/compsci240
- learn.zybooks.com
- pages.cs.wisc.edu/~hasti/cs240 (includes info about getting started and serves as a place to post updates if Canvas is down)

Topics

The following is a tentative schedule of the topics to be covered (with the approximate number of weeks in parentheses):

- intro and course overview (0.5 week)
- propositions and predicates (1)
- sets (1)
- proof techniques (1)
- induction (1)
- invariants (0.5)
- program correctness (1)
- recursion and structural induction (1)
- recurrences (1)
- asymptotic analysis (1)
- functions and relations (1)
- graphs and trees (1.5)
- finite automata and regular expressions (1)
- counting (1.5)

Course Website and Digital Instructional Tools:

The main course website is on Canvas.

Piazza is used for asking and answering questions, course communications, etc. There is a link to Piazza within the Canvas site for this course.

Zoom is used for some office hours. There is a link to Zoom within the Canvas site for this course.

Gradescope is used to grade and communicate feedback for some assessments. Details about accessing Gradescope will be provided at that time.

Discussion Sessions:

Each student attends one discussion section a week. In discussion section the student has the opportunity to get more practice with concepts in the course and solving problems under the direction of one or two TA instructors. Discussion participation is worth 3% of the total grade; each discussion section counts for 1/3%. A student must attend the discussion section for which they are registered; missed discussion sections may not be made up.

Required Textbook, Software and Other Course Materials:

Course content comes from many sources: lecture, on-line readings, zyBook e-text, discussion worksheets, course web site, Piazza discussions.

The on-line readings are available on the Canvas site for this course.

Instructions for registering for the course zyBook are available on the Canvas site for this course.

Homework and Other Assignments:

Assignments

There are 14 assignments due approximately weekly, worth 30% of the final grade. The assignment portion of the grade is out of a max of 400 points:

- the first assignment is worth 9 points
- the rest of the assignments are worth between 24 and 37 points each

Each assignment may contain:

- zyBooks Challenge Activities
- on-line quizzes
- written homework

zyBooks Participation

3% of the final grade comes from completing zyBook Participation Activities. Completing 80% (or better) of the participation activities on time (over the course of the semester) will result in the student earning the full 3%.

Additional Participation Activities

2% of the final grade comes from completing Additional Participation Activities. These are used to supplement areas not covered by the zyBook and consist of Canvas quizzes for which students have unlimited attempts.

Deadlines

A tentative schedule of due dates is available on Canvas.

Policies

Full information about late policies, submission procedures, and academic conduct expectations are provided on Canvas.

EXAMS, QUIZZES, PAPERS, COURSE SCHEDULE and GRADING

Exams, Quizzes, Papers and Other Major Graded Work:

There are three exams worth a total of 62% of the final grade:

- **Exam 1 (20%):** Monday, October 16th, 7:30 pm to 9:30 pm
- **Exam 2 (20%):** Monday, November 13th, 7:30 pm to 9:30 pm
- **Exam 3 (22%):** Tuesday, December 19th, 2:45 pm to 4:45 pm

The first two exams are during the semester, in the evenings; the third exam is during the summary period. The exams are all unit exams (i.e., not cumulative).

Students must notify the instructor (via an on-line form available on Canvas) of conflicts with any exam during the first three weeks of class.

Unless otherwise stated:

- All exams are written on paper and are closed book and closed notes.
- No calculators or other electronic devices are allowed during exams.

Grading:

Final letter grades are determined from your final cumulative score that is computed using the following breakdown:

- **62% Exams :**
3 exams, 2 during the semester each worth 20% of your final grade and one during the final exam period worth 22% of your final grade
- **30% Assignments :**
400 points coming from written work, on-line Canvas quizzes, and zyBooks Challenge Activities divided into 14 assignments
- **8% Participation :**
 - 3% zyBook Participation Activities
 - 2% Additional Participation Activities
 - 3% Discussion participation

Letter grades are assigned at the end of the semester. The curve is determined after the final exam is completed. The median student's course grade is anticipated to be a low B or high BC.

ACADEMIC POLICIES and STATEMENTS

Academic Policies:



Syllabus Statements

<https://guide.wisc.edu/courses/#SyllabusStatements>

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