![UVU Utah Valley University logo]

Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Course Prefix: CS
Course Title: Discrete Mathematics I

Year: 2025
Course and Section #: 2300-X02
Credits: 3

Course Description

Covers algebraic structures applied to computer programming. Includes logic, sets, elementary number theory, mathematical induction, recursion, algorithm complexity, combinatorics, relations, graphs, and trees. Lab access fee of $45 for computers applies.

Course Attributes
This course has the following attributes:
☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☐ Elective Core Requirements in Program
☐ Open Elective
Other: *Click here to enter text.*

Instructor Information
Instructor Name: Jenny Nehring

Student Learning Outcomes
Upon successful completion, students should be able to . . .
1 Use symbolic logic to determine proper conditional clauses in a program
2 Prove theorems algebraically
3 Perform basic operations on sets
4 Determine the nature of the growth of a function or algorithm
5 Prove properties of recursive algorithms using mathematical induction
6 Use relations and functions in the design of algorithms and applications

Course Materials and Texts
The textbook for this course will use the following digital textbook: CS 2300 - Discrete Mathematical Structures I, Sandy Irani, zyBook ISBN: 978-1-394-02772-9 purchased from **Learn zyBooks.**
If you are using Wolverine Access (flat fee of $250 per semester for all textbooks):

Zybook access codes should be provided to you by the Library. Stay tuned for details.
If you have opted out of Wolverine Access:
- Students are required to purchase access from **Learn zyBooks.** for $64.
- Subscribe to the book:
  - Sign in or create an account at learn.zybooks.com.
  - Enter zyBook code: UVUCS2300CordnerSpring2025
  - Subscribe (This course is CS2300-001)
- You can start the subscription on Dec. 23, 2024. The cutoff to subscribe is Apr. 20, 2025. Subscription will last until May 19, 2025.

Course Requirements

Course Assignments, Assessments, and Grading Policy
Assignment and Assessment Descriptions
ZyBook Activities:
Participation and challenge activities will be assigned in the online textbook through zybooks.com. These activities will be auto-graded by zyBooks. **(20% of overall grade)**
Assignments:
There are written assignments located at the end of each section in zyBook. You have the option of working on these assignments if you believe that you need more practice learning a specific topic. I have opened up the answers for you so that you will know if you are doing them correctly. These are optional and will not be submitted. **(Optional)**
Quizzes:
There is a quiz at the end of each module. You will complete the quiz in Canvas. You have two attempts for each quiz. The higher score will be kept for grading purposes. The two lowest quiz scores will be dropped. **(15% of overall grade)**
Assessments:
There are two midterms and one final exam as the assessment instrument for this course. Each midterm covers 3 chapters and the final covers primarily the last 3 chapters; 75% from the last 3 and 25% from previous chapters. All exams will be timed. **(65% of overall grade)**

Grading and Late Work Statement
Grading Scale:
The following grading standards will be used in this class:

Grading Scale Table

Grading Scale:

93% or higher	A	90 - 92.9%	A-
87 - 89.9%	B+	83 - 86.9%	B
80 - 82.9%	B-	77 - 79.9%	C+
73 - 76.9%	C	70 - 72.9%	C-
67 - 69.9%	D+	63 - 66.9%	D
60 - 62.9%	D-	0 - 59.9%	E

Assignment Categories:

Activity	Percent
ZyBook Activities	20%
Quizzes	15%
Exams	65%

Late Work Statement:
Late work grades will be reduced by 2% each day with a max penalty of 40%.

Required or Recommended Reading Assignments
Course Schedule
All required readings use chapters from the course text that align with the lectures below.

General Description of the Subject Matter of Each Lecture or Discussion
Module 0 – Overview of course and requirements, introduction to LaTeX

Chapter 1 – Introduction to propositional logic, truth tables, laws of propositional logic, quantifiers, De Morgan's laws

Chapter 2 – Introduction to set theory, set operations (union, intersection), set identities, cartesian products, set partitions

Chapter 3 – Introduction to mathematical functions, floor and ceiling functions, properties (one-to-one, onto), inverses, composition, logarithmic and exponential functions

Chapter 4 – Introduction to binary relations, properties (symmetric, reflexive, transitive), representations (directed graphs, matrices), transitive closure, partial orders, strict orders and directed acyclic graphs, equivalence relations

Chapter 5 – Introduction to Integer Properties, the division algorithm, modular arithmetic, prime factorizations, factoring and primality testing, greatest common divisor and Euclid's algorithm, number representation, fast exponentiation, introduction to cryptography, the RSA cryptosystem

Chapter 6 – Introduction to sequences and recurrence relations, mathematical induction, recursive algorithms

Chapter 7 – Introduction to counting, sum and product rules, the bijection rule, the generalized product rule, counting permutations, counting subsets, counting by complement, the pigeonhole principle

Chapters 8 and 9 – introduction to undirected graphs, graph isomorphism, graph connectivity; introduction to trees, tree traversal, spanning trees

Required Course Syllabus Statements

Generative AI
Students should use ChatGPT (or similar AI tools) as if it were a person. If asking another person to do task X is cheating, then asking ChatGPT and similar tools is cheating. If not, then not.

Using Remote Testing Software
☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity
At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and

writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX
Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation
UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.
To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.