

Syllabus for CSE15: Discrete Mathematics

Fall 2022

Instructor: Renato Madureira De Farias

Designation:	Discrete Mathematics
Catalog Description:	Covers the basic concepts of discrete mathematics used in computer science and other disciplines that involve formal reasoning. The topics include logic, proofs, counting, set theory, algorithms, and number theory.
Text Books and Other Required Materials:	K.H. Rosen, Discrete Mathematics and its Applications. McGraw Hill, 8th edition (textbook recommended, but not required).
Course Objectives/ Student Learning Outcomes:	<p>This course will cover five major themes:</p> <ol style="list-style-type: none">1. Mathematical reasoning: Students are expected to use mathematical reasoning in order to read, comprehend, and construct mathematical arguments. Students will learn basic concepts of mathematical logic and proof.2. Combinatorial analysis: Students will count or enumerate objects and perform combinatorial analysis.3. Discrete structures: Students will learn the basic concepts of sets, permutations, relations, graphs, trees and finite state machines. Students will represent discrete objects and relationships using abstract mathematical structures.4. Algorithmic thinking: Students will verify whether an algorithm works well and perform analysis in terms of memory and time.5. Applications and modeling: Discrete mathematics has been used in numerous applications. Students will formulate and model problems with the concepts and techniques of discrete mathematics. <p>Student Learning Outcomes:</p> <p>A. An ability to apply knowledge of computing and mathematics appropriate to the discipline.</p>
Program Learning Outcomes:	<p>This course relates to the following program learning outcomes:</p> <p>An ability to apply knowledge of computing and mathematics appropriate to the discipline;</p> <p>An ability to apply mathematical foundations, algorithmic principles, and computer science theory to the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices.</p>
Prerequisites by Topic:	
Course Policies:	
Academic Dishonesty Statement:	<ol style="list-style-type: none">a. Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy. Any work submitted by a student in this course for academic credit will be the student's own work.b. You are encouraged to study together and to discuss information and concepts covered in lecture and the lab sections with other students. You can give "consulting" help to or receive "consulting" help from other students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e mail, an e mail attachment file, a diskette, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Policy can also be extended to include failure of the course and University disciplinary action.c. During examinations, you must do your own work. Talking or discussion is not

permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam and may lead to failure of the course and University disciplinary action.

Disability Statement:

Accommodations for Students with Disabilities: The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

Topics:

- Propositional logic
- Predicate logic
- Inference and proofs
- Sets
- Functions
- Sequences and series
- Technical proof methods
- Recursion and trees
- Basic counting
- Permutations and combinations
- Recurrences

**Class/laboratory
Schedule:**

LECT MW 4:30-5:45pm; Lab: See class schedule for times and locations

**Midterm/Final Exam
Schedule:**

No midterm. Take home final exam.

Course Calendar:

Professional Component:

Assessment/Grading

Homework: 60%

Policy:

Final Exam: 40%

Coordinator:

Renato Farias

Contact Information:

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Office: SE2-278

I will try to answer your emails within 48 hours. However, I may not be able to answer emails at certain times, such as late in the day or during weekends/holidays. Please plan accordingly.

Office Hours:

Office hours will be announced on CatCourses.