NOTE: This document must be shared and discussed with the students of the course in the first class of every semester.

Textbook and Its Usage

CSE 230 exclusively focuses on improving students' logical reasoning, mathematical modeling, and critical problem-solving skills that are essential for becoming successful computer engineers and scientists. In that regard, Keneth H. Rosen's textbook is considered the de facto standard and is being taught in numerous schools all over the world. CSE 230 focuses on rigorously covering the first half of the book. Note that, reading the book is NOT A RECOMMENDATION, RATHER A MANDATORY part of the course. The students must make it a habit of reading the corresponding chapter sections of the book every week that are related to that week's lectures.

Note that the midterm and final exams of the course will take problems from the examples and exercises of the book. The course instructors will tell the students what exercise problems they need to solve to be well prepared for the exams.

Note that the after-midterm lectures of the course cover materials from the book more quickly assuming that students are on track with materials discussed earlier. Hence, the students must understand that piling things up for studying just before the exams will most likely have a disastrous consequence for them. So please do not put yourselves in that state. Remember that passing this course is easy, getting an A in this course is also easy, however, the easiest thing is to fail in this course. All students have to do for achieving that is not study regularly.

Strategy for Quizzes

To ensure students' regular time investment towards studying materials covered in class, CSE 230 follows the policy of weekly quizzes. Every even numbered lecture will have a 15 minutes long quiz at the end of it. In the quiz, the students will solve a single problem for 12 minutes related to the current and last lecture. The remaining three minutes is reserved for question paper distribution and answer script collection. Students' quiz scores for the final grade will be counted as the average of best **N – 3** quizzes.

ST and Instructors' Office Hours Protocol

Since this is a mathematics course including a lot of quizzes whose grading takes time, STs for this course are responsible for quiz grading only and will not hold office hours. The students are expected to utilize the best use of instructors' office hours for clarifications related to concepts and to get help in some exercise problem solving matters. Since all sections of the course follow the same lecture plan, **students can go to any instructor of any section during his/her consultation hours to get help.** The consultation hours for all the instructors will be shared with all students in the first week of the semester.

Lecture Schedule

Lecture Serial	Lecture No	Lecture Topics	Textbook	Reference
1	Lecture 1	1. The notion of logic and proof 2. Meaning of a proposition 3. Logical Connectives	Chapter 1 Section 1.1 (up to conditional statements)	Three weeks to complet

2	Lecture 2	4. Truth tables of Conditional Statements	Chapter 1 Section 1.1 (from conditional statements to the end of the section) Section 1.2	e Chapter 1

3	Lecture 3	1. Compound Propositions 2. Tautology and Contradictions 3. Logical Equivalence	Chapter 1 Section 1.2 and 1.3 (Except De Morgan's Law and Its Application)	
4	Lecture 4	1. Universal and Existential Quantification 2. De Morgan's Law 3. Nested Quantifiers 4. Applying De Morgan's Law in Nested Quantifier	Chapter 1 Section 1.3 (De Morgan's Law and its Application) Chapter 1 Section 1.4 Chapter 1 Section 1.5	
5	Lecture 5	1. Proof Techniques a. Proof by Construction b. Proof by Contraposition c. Proof by Contradiction d. Proof by Counterexample	Chapter 1 Section 1.7	
	Lecture 6	1. Proof Techniques Review 2. Fallacies 3. Conjectures	Chapter 1 Section 1.6, 1.7 and 1.8	
6	Lecture 7	1. Set Terminologies a. Set and Set Notations b. Empty Set, Subsets, Power sets, Cartesian Products c. Infinite Sets d. Venn Diagrams	Chapter 2 Section 2.1	Three weeks to complete Chapter 2
7	Lecture 8	1. Set Operations 2. Set Identities 3. De Morgan's Law for Set Operations	Chapter 2 Section 2.2	

8	Lecture 9	1. Function Definition 2. Domain, and Range 3. One-to-one and Onto Functions 4. Cardinality of Sets	Chapter 2 Section 2.3 (up to Composition and invertibility) and Section 2.5	
9	Lecture 10	1. Invertibility and Inverse Functions 2. Function Compositions	Chapter 2 Section 2.3 (from invertible function to the rest of the section)	
10	Lecture 11	1. Sequences and their Summation 2. Recurrence Relations	Chapter 2 Section 2.4	
11	Lecture 17	1. Mathematical Induction	Chapter 5 Section 5.1	
	Lecture 12	1. Matrices 2. Matrix Operations	Chapter 2 Section 2.6	
	Lecture 13	1. The Definition of Algorithm 2. Characteristics of an Algorithm 3. Growth of a Function 4. Time complexity of Algorithms	Students are encouraged to read the full Chapter 3. However, the syllabus is the slides and shared resources.	
12	Lecture 15	1. Logic of Integer Representation 2. Decimal and Hexadecimal Representations 3. Binary Representation 4. Binary Addition Algorithm 5. Binary Multiplication Algorithm	Chapter 4 Section 4.2	
13	Lecture 14	1. Divisibility 2. Modular Arithmetic 3. Congruence Relation	Chapter 4 Section 4.1	Half of Chapter 4 in 1.5 Weeks
14	Lecture 21 Optional	gcd, lcm Modular exponentiation Linear congruence		

15	Lecture 16	1. Prime Numbers 2. Prime Factorization 3. Relative Prime Number 4. Fermat's Little Theorem	Chapter 4 Section 4.3 And only Fermat's Theorem from Section 4.4	

16	Lecture 18	1. Recursive Definition 2. Recursive Algorithms 1. Homogeneous recurrence relation	Chapter 5 Section 5.3 and Section 5.4 (up to recursive binary search)	Exam Syllabus only Includes Section 5.1 and 5.3 (Two sections to study in a week)
17	Lecture 19	1. Rules of counting a. Sum Rule b. Product Rule c. Subtraction Rule 2. The Pigeonhole Principle	Chapter 6 Section 6.1 and 6.2	
18, 19, 20	Lecture 20 Lecture 22 Lecture 23	1. Permutations 2. Combinations	Chapter 6 Section 6.3	