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 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 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.

Marks Distribution

Assignment- 10%
Quiz - 25%

Midterm - 30%
Final - 35%

Lecture Schedule

Slide No	Lecture Topics	Textbook	Reference
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 complete Chapter 1
2	4. Truth tables of Conditional Statements	Chapter 1 Section 1.1 (from conditional statements to the end of the section) Section 1.2	
3	1. Compound Propositions 2. Tautology and Contradictions 3. Logical Equivalence 4. Simplification using series of logical equivalence	Chapter 1 Section 1.2 and 1.3 (Except De Morgan's Law and Its Application)	
4	1. Universal and Existential Quantification 2. De Morgan's Law 3. Nested Quantifiers 4. Applying De	Chapter 1 Section 1.3 (De Morgan's Law and its Application) Chapter 1 Section	

	Morgan's Law in Nested Quantifier	1.4 Chapter 1 Section 1.5	
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	
6	1. Proof Techniques Review 2. Fallacies 3. Conjectures	Chapter 1 Section 1.6, 1.7 and 1.8	
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
8	1. Set Operations 2. Set Identities 3. De Morgan's Law for Set Operations	Chapter 2 Section 2.2	
9	1. Function Definition 2. Domain, and Range 3. One-to-one and Onto Functions	Chapter 2 Section 2.3 (up to Composition and invertibility) and Section 2.5	

	4. Cardinality of Sets		
10	1. Invertibility and Inverse Functions 2. Function Compositions	Chapter 2 Section 2.3 (from invertible function to the rest of the section)	
11	1. Sequences and their Summation 2. Recurrence Relations	Chapter 2 Section 2.4	
17	1. Mathematical Induction	Chapter 5 Section 5.1	
End of Mid Term Syllabus			
12	1. Matrices 2. Matrix Operations	Chapter 2 Section 2.6	
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.	
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	

	6. Modular exponentiation		
14	1. Divisibility 2. Modular Arithmetic 3. Congruence Relation 4. **Congruence proofs divisibility** (cover from book)	Chapter 4 Section 4.1	
	GCD, LCM Euclid's algorithm Linear congruence	Chapter 4 Section 4.3	
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	
18	1. Recursive Definition 2. Recursive Algorithms 1. Linear Homogeneous recurrence relation (cover from book)(8.2) 2. Linear Non Homogeneous recurrence relation (cover from book)(8.2)	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)
19	1. Rules of counting a. Sum Rule b. Product Rule c. Subtraction Rule	Chapter 6 Section 6.1 and 6.2	

	2. The Pigeonhole Principle		
20	1. Permutations 2. Combinations	Chapter 6 Section 6.3	