

COSC 795 PhD Written Qualifying Examination

PhD Qualifying Exam Topic	Department
Design and Analysis of Algorithms	Computer Science

The exam is closed book and closed notes. Basic scientific calculator is allowed.

Relevant Undergraduate Course(s) at Khalifa University:

- COSC 312 Design and Analysis of Algorithms

Topics:

#	Topic Title	Reading Material [Primary Textbook, Chapter]
01	Worst Case Analysis: Recurrences & Asymptotic Behavior	Chapters 1, 2, 3, 4.3-4.5
02	Probabilistic Analysis: Average Case Analysis	Chapters 5.1-5.3, 7
03	Sorting and Order Statistics	Chapters 7, 8, 9
05	Hash Tables	Chapter 11
04	Balanced Binary Search Trees	Chapters 12, 13, 17
06	Algorithm Design: Divide-and-Conquer, Dynamic Programming, & Greedy Algorithms	Chapters 4.1, 4.2, 14, 15
07	Amortized Analysis	Chapter 16
08	Graph Algorithms	Chapters 20, 21, 22, 23, 24
09	Number-Theoretic Algorithms	Chapter 31.1-31.7
10	Complexity Theory: P, NP, NP-Completeness, & Reductions	Chapter 34

Primary Textbook(s):

- [1] Thomas Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, Introduction to Algorithms, MIT Press, 4th Edition, 2022. ISBN: 978-0262046305.