

Beirut Arab University
Faculty of Science
Department of Mathematics and Computer
Science

Computer Science
Comprehensive Exam Guidelines

Exam Time: 9:00 AM- 12 noon

Tuesday April 28th, 2015

The written exam comprises both general and specialized topics in computer science. Specialized topics related to research papers selected by the students and approved by the exam committee, see the exam parts below. After the written exam, an oral exam date is assigned within two weeks of the written exam where the student present a report in front of the advisors committee. The final decision is taken based on both the written and oral exams.

General Part:

Operating systems is the management of both system and user processes. The topics covered in this regard are: process scheduling, CPU scheduling and main memory management.

Theory of Computation topics that aim to provide the sense of interest for computability theory, automata theory and complexity theory in order to be able to determine what can be computed and what cannot be computed, its time and memory complexity, and on which type of computational model. The topics covered in this regard are: Deterministic and nondeterministic finite automata, regular languages, regular expressions, closure under the regular operations, context free languages, context free grammar, push down automata, proving that a language is not regular or not context free, Turing machine, decidable languages, undecidability, and the halting problem

Data structures provide a means to manage large amounts of data efficiently for uses such as large databases and internet indexing services. The topics covered in this regard are: Arrays, Linked List, Stacks, Queues, Priority Queue, BinaryTrees, Binary Search Trees, AVL Trees, Heaps, and Graphs

Recommended Textbook(s):

1. Thomas H. CORMEN, Introduction to Algorithms, 2nd Edition, the MIT Press, 2001
2. Robert Lafore, Data Structures & Algorithms in Java, 2nd Edition, Sams Publishing, 2003
3. Operating System Concepts. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne.
4. Introduction to the Theory of Computation, by Michael Sipser -- PWS publishing co. 2nd edition.
5. Automata, Computability, and Complexity: Theory and Applications, by Elaine Rich.
6. Introduction to Automata Theory, Languages, and Computation, by John E. Hopcroft, Rajeev Motwani, and Jeffrey D. Ullman – Addison Wesley Publisher (3rd Edition).

Specialized Part:

Prior to the written exam, the students should meet with their advisor committee assigned by the department to specify the prospective area of research where the students is intending to prepare the PhD thesis. The committee assigns some research papers related to the students specialization. This part of the written exam is designed to examine the student in the assigned papers.