INTERNATIONAL UNIVERSITY
FOR SCIENCE & TECHNOLOGY

الجَامِعَة الدّوليّة الخَاصّة للعُلومِ وَالتّكنُولوجيَا

401222 Design and Analysis of Algorithms

[3 cr., 3, 0] Introduction to Algorithms: Idea of algorithms, algorithms and programs. Basic Algorithmic Analysis: Asymptotic analysis of upper and average complexity bounds; best, average, and worst case behaviors; big-O, little-o, W, and λ notation; standard complexity classes; empirical measurements of performance; time and space tradeoffs in algorithms; using recurrence relations to analyze recursive algorithms. Proof of Correctness. Fundamental Algorithm Design Strategies: divide-and-conquer; greedy; backtracking; branch-and-bound; non-deterministic; numerical approximation. Lower Bound Theory: Sorting and searching, lower bound examples NP-Hard and NP-complete Problems: Basic Concepts, NPHard & NP-complete problems, examples.