

# **COT-5407 Introduction to Algorithms**

## **Catalog Description**

Design of efficient data structures and algorithms; analysis of algorithms and asymptotic time complexity; graph, string, and geometric algorithms; NP-completeness. (3 credits)

## **Prerequisites**

SCIS Graduate Standing

## **Type**

Required for MSCS

Elective for MSIT and MSTN

Ph.D. students should take COT-6405

## **Course Objectives**

Students will learn techniques for designing efficient algorithms, for elementary analysis of algorithms, for proving lower bounds, and for proving intractability.

## **Topics**

Recurrence Relations and Analysis of Algorithms

Incremental and Divide-and-Conquer Algorithms

Sorting and Order Statistics

Lower Bound Arguments

Basic data structures: trees, hash tables, priority queues, union/find

Graphs & Graph Algorithms

Dynamic Programming & Greedy Algorithms

NP-Completeness

## **Textbook**

Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, *Introduction to Algorithms, Third Edition*, (MIT Press, 2009).

## **Last Update**

Mark Weiss 8/30/2012