

# FLORIDA INTERNATIONAL UNIVERSITY

## Computer Science Department

**COURSE NUMBER:** COT-6936

**TITLE:** TOPICS IN ALGORITHMS

**INSTRUCTOR:** Mark Weiss, Room ECS-361, Phone 2036

**TEXT:** R. Sedgewick, *Algorithms*, Second edition, Addison Wesley, 1988.

**PREREQUISITES:** Data Structures (COP-3530)

**SCHEDULE:** Mon 3:30 - 6:15 PM.

### TOPICS

Data Structures: Skip Lists, Garbage collection, Binary Trees, Binary heaps, Min-Max Heaps, Leftist heaps, Binomial Queues, Fibonacci heaps, Red-black trees, Splay trees, Treaps.

Searching and Pattern Matching: Binary Search, Interpolation Search, Extrapolation search, Knuth-Morris-Pratt Algorithm, Rabin-Karp Algorithm, Pattern matching machines.

Text Manipulation: File compression, Cryptography.

Computational Geometry: Intersection problems, Convex hull, triangulation, closest-point problems.

Numerical Algorithms: Random number generators, polynomial arithmetic, matrix arithmetic, Gaussian elimination, curve fitting, primality testing and factoring.

Optimization Theory: Network Flow, Matching, Linear Programming.

Parallel Algorithms: PRAM models, NC problems, Finding the maximum, Minimum Spanning Tree on a CRCW, Sorting networks, Systolic arrays for matrix multiplication.