COT 6401 - Analysis of Algorithms

- **Catalog Description**:

  The design and analysis of algorithms from several areas of Computer Science. Tipics will be chosen from advanced data structures, dynamic programming, greedy algorithms, dynamic programming, approximation algorithms, and probablistic algorithms.

- **Textbooks**:

  1. *Introduction to Algorithms*
     T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, McGraw Hill, 2001.

- **Reference book**:

  1. *Computer Algorithms: Introduction to Design and Analysis.* Baase, Sara and Gelder, Allen Van, 3nd ed., Addison-Wesley Publishing Company, 2000.

- **Instructor**:

  Dr. Jie Wu, Professor of Computer Science and Engineering
  jie@cse.fau.edu, http://www.cse.fau.edu/˜jie

- **Goals**: To acquire working knowledge of analysis and design techniques. To learn the importance of good choice of data structures for algorithm design. To learn different methods for designing algorithms for hard problems.

- **Class time**: M-W 2:00 PM - 3:20 PM

- **Office hours**: M-W 3:30 PM -5:30 PM, S&E 410

- **Prerequisite by topic**:

  1. MAD 2104 Discrete Mathematics
  2. COP 3530 Data Structure
  3. COT 4400 Designa and Analysis of Algorithms

- **Topics**:

  1. Introduction
  2. Foundations: growth of functions and recurrences
  3. Advanced data structures for dynamic sets: Trees (red-black trees, B-trees) and heaps (binomial heaps, Fibonacci heaps)
  4. Graph algorithms
  5. Dynamic programming
  6. Greedy algorithms
  7. Approximation algorithms
  8. Probablistic algorithms
  9. Advanced tools: amortized analysis and adversary arguments
  10. Other topics: parallel algorithms and design by induction