

# CS404/504: Design and Analysis of Algorithms

## Fall 2009

**Class Meetings:** Mon, Tue, Thu, Fri 1:10pm – 2:00pm, Stocker 106

**Instructor:** Razvan Bunescu

**Office:** Stocker 337, Phone: 593-1579

**Office Hours:** Tue 10am-12pm, Fri 10am-12pm, or by email appointment

**Email:** bunescu@ohio.edu

**Class Website:** <http://ace.cs.ohio.edu/~razvan/courses/cs404/>

**Prerequisites:** CS361 (Data Structures) and some mathematical dexterity.

### **Textbook:**

*Introduction to Algorithms* by T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, 2nd ed, McGraw-Hill, 2001.

### **Course Description:**

This course provides an introduction to the modern study of computer algorithms. Through this course students should be able to:

- 1) Analyze algorithm performance using complexity measurement.
- 2) Master major algorithms design techniques such as divide and conquer, greedy and dynamic programming.
- 3) Apply the above approaches to solve a variety of practical problems such as sorting and selection, graph problems, and other optimization problems.
- 4) Understand the theory of NP-completeness.

### **Grades:**

- 15%: 5 HW assignments
- 10%: 2 Quizzes
- 10%: Project
- 30%: Midterm Exam
- 35%: Final Exam

### **Exam Dates:**

**Midterm:** Thursday, Oct. 22, 1:10pm - 2:00pm

**Final:** Tuesday, Nov. 24, 2:30pm - 4:30pm

**Other Important Dates:**

Friday, Sep. 18: Faculty retreat, no class.  
 Monday, Oct. 12: Last day to drop class.  
 Monday, Nov. 16: Last day of this class.

**Tentative Schedule:**

Week 1	Preliminaries (1, 2), Asymptotic Notation (3)	
Week 2	Master Theorem (4), Heap Sort (6) D&C: Quick Sort (7)	HW1 out
Week 3	Linear Time Sort (8), D&C: Selection (9) D&C: Matrix Multiplication (28)	HW2 out Quiz 1
Week 4	D&C: Closest Pair (33) Greedy: Minimum Spanning Trees (23)	HW3 out
Week 5	Greedy: SSSP (24) Greedy: Knapsack, Review	HW4 out
Week 6	DP: Knapsack DP: Matrix-Chain Multiplication	Proj. out
Week 7	DP: LCS, DP: Coin Changing	Midterm
Week 8	DP: APSP (25) Maximum Flow, Bipartite Matching (26)	Quiz 2
Week 9	Classes P & NP (34), NP-completeness (34)	HW5 out
Week 10	NP-complete problems (34), Review	
Week 11		Final

**Course and Attendance policies:**

All homework assignments are due before the class. No late submissions will be accepted. It is in your best interest to attend all the lectures. Some of the material will not be found in the textbook. Extra credit (up to 5 final points) will be awarded for class activity.

**Academic Dishonesty Policy:**

All work must be the student's own. All external references used in reports must be properly cited. Plagiarism will result in an F for the exam, project or assignment, and possible for the course. Stronger measures, within the guidelines of the Student Handbook, may be taken when conditions warrant. The OU Student Code of Conduct Policy is available online at [http://www.ohio.edu/judiciaries/conduct\\_policy.cfm](http://www.ohio.edu/judiciaries/conduct_policy.cfm).

**Other Policies:**

Be sure to notify the professor of any exam conflicts or other extenuating circumstances in advance. No missed exams will be made up without prior approval.