

# CS 5329 Algorithms, Fall 2008

<b>Section 001</b>	Days T,Th Time 5:00 pm - 6:15 pm, Room AVRY 364, ALK 102
<b>Instructor</b>	Dr. Oleg Komogortsev
<b>Office</b>	Nueces 261, Telephone: (512) 245-0349
<b>E-mail</b>	ok11@txstate.edu
<b>Webpage</b>	The course material will be available from TRACS website <a href="https://tracs.txstate.edu/portal">https://tracs.txstate.edu/portal</a>
<b>Office hours</b>	W,Th Time 2 p.m. – 4:30 p.m., and by appointment

## Course Description

This course is a graduate course on the design and analysis of algorithms. The course builds on the study of the analysis and implementation of data structures and algorithms from CS 3358. The goal is to introduce a number of important algorithm design techniques as well as basic algorithms that are interesting both from a theoretical and also practical point of view. We will cover basic algorithm design techniques such as divide-and-conquer, dynamic programming, and greedy techniques for optimization. We will cover techniques for proof of the correctness of algorithms and also asymptotic analysis of algorithm time bounds by the solution of recurrence equations. We will apply these design and analysis techniques to derive algorithms for a variety of tasks such as sorting, searching, and graph problems. Some specific algorithm topics include: deterministic and randomized sorting and searching algorithms, depth and breadth first search graph algorithms for finding paths and matchings, and algebraic algorithms for fast multiplication and linear system solving. The knowledge of the course is going to be tested through projects, homeworks, and exams.

## Main Text

**Algorithm Design: Foundations, Analysis, and Internet Examples**, Michael T. Goodrich, Roberto Tamassia, ISBN-13: 978-0471383659

## Supplementary Material

- Introduction to Algorithms, Second Edition by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, ISBN 0262531968
- Data Structures and Program Design In C (2nd Edition) by Robert L. Kruse, Bruce P. Leung, Clovis L. Tondo

## Materials and equipment

A PC is required to complete the lab assignments. You may use your own personal computer or a computer on campus. You may want to save your work (when necessary) on an usb drive or send your work files to your e-mail account for later access.

**Prerequisites** The prerequisite for this class is Data Structures (CS3358) with a grade of C or better. You are expected to have completed the prerequisites for this course, and failure to do so may impair your chances for success in this class. You are encouraged to consult with the instructor promptly if you have not completed the prerequisites.

**Credits** 3

## **Homework and Projects**

Homework will consist of several take home problems. The solution for these problems will require a deep understanding of the course material and the ability to apply the knowledge you have learned in this course. The projects will require the understanding of the algorithms and programming abilities for implementation in C/C++ or Java.

## **Grading**

- 2/5 exams. 50-65%
- 1/5 project (using Linux/C++).....25-35%
- 1/7 written homework. 0-25%

## **Final Exam Time**

December 11 5-7:30p.m.

## **Academic Honesty:**

All work submitted for a grade is expected to be your own. As a guideline, you may talk together, but do not write together. Projects may be subject to review through TurnItIn. Students in this class are expected to adhere to the Texas State University Honor Code. Any violation means that the work will not be accepted and further action will be taken. Plagiarism will not be tolerated.

## **Attendance:**

Regular and punctual attendance is expected, and excessive absences may influence your final grade. It is your responsibility to know what goes on during class. It is up to the student to make up any missed material. Make-ups will only be given in the case of an excused absence or a documented, valid emergency. This includes tests and homework. I encourage you to contact me if an emergency arises.

## **Academic Policies:**

See the Student Handbook for more information about Texas State Academic Policies including probation, suspension, academic honesty, dropping a class, incompletes, grade changes, and withdrawal.

## **Respectful Student Conduct**

This class follows Texas State University's regulations regarding behavior in the classroom. It is expected that each student will be respectful to the instructor as well as to fellow classmates. Students should behave maturely and professionally.

Use of profanity, rudeness towards fellow students or the instructor, angry outbursts, refusal to participate in classroom activities, repeated tardiness, ringing of cell phones and leaving the classroom prior to class dismissal without the approval of the instructor are just some examples of disruptive behavior. The instructor will ask disruptive student to cease and desist and will inform the student of possible suspension and/or dismissal from class.

### **Special Needs:**

Students with special needs as documented by the Office of Disability Services should identify themselves at the beginning of the semester.