Fall 2014 Comp 282 Advanced Data Structures

Instructor: Diane Schwartz

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Instructor website : [www.csun.edu/~dls](http://www.csun.edu/~dls)

Moodle site: [moodle.csun.edu](file:///C:\Users\dls\Documents\Comp%20282%20F14\moodle.csun.edu) (Course materials will be posted on Moodle)

Office Hours: Tues 2:00 – 4:00

I am teaching two sections of Comp 282 in Fall 2014

Section Number 15115 meets TTH 930 – 1045 AM in JD 3508

Section Number 15116 meets TTH 12:30 – 1:45 PM in JD 3508

**Course Description:** An introduction to advanced data structures using object-oriented design. Main memory structures: heaps, hash tables, balanced trees, graphs. Advanced searching and sorting, including external memory searching and sorting. Algorithm analysis. Introduction to database concepts.

**Prerequisites:** Grade of C or better in Math 150A and Comp 182/182L .

**Required Textbook:** Data Abstraction and Problem Solving with JAVA 3rd Edition by Prichard and Carrano ( The 2nd edition is also ok to use.) **Text Website: www.pearsonhighered.com/cssupport**

**Lecture Topics** (Chapters are from Prichard and Carrano)

1. Introduction.
2. Java Generics, Interfaces (Chap 9.3, 9.4. Will be introduced as needed.))
3. Java Collection Framework ( Will be introduced as needed)
4. Heaps and Priority Queues (Chapter 12)
5. Binary Search Trees –Brief Review ( Chap 11)
6. Balanced Trees (Chapter 13.1)
7. Hashing (Chapter 13.2)
8. Graphs (Chapter 14)
9. Sorting – Review ( Chap 10)
10. External Methods (Chap 15)
11. Intro to Databases

**Course Goals (from the student perspective):**

1. To improve your ability to solve problems using computer programming.

2. To learn how to implement and use advanced data structures in Java

3. To improve your ability to design, write, test and debug computer programs.

4. To learn how to analyze algorithms.

**Software:** We will be programming in Java with JDK 6.0 + and JGRASP, available in JD 2214. You can also download Java JDK 6.0 from http://www.sun.com and download jgrasp ( java development environment) from http://www.jgrasp.org

On-line Java Documentation: http://docs.oracle.com/javase/6/docs/api/index.html

**Grading Policies:** Plus and minus grading will be used. Your grade will be weighted as follows:

Midterms (3) 25% each

Programming Projects 25%

There will be no final exam. There will be a final project.

**Grading Standards:** 90% – 100% A-, A range; 80% - 89% B-, B, B+ range;

70 – 79% C-, C, C+ range; 60% – 69% D range; < 60% F

**Academic Dishonesty:** All instances of academic dishonesty on exams or programming projects will be reported to the Vice President of Student Affairs and will result in a grade of F on the assignment and may result in an F in the course. If you are not sure what is considered academic dishonesty, please ask your instructor for guidance.

COURSE OUTLINE (Tentative)

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| **Lecture Days** | **Lecture Topics** | **Text Reading Assignment** |
| 8/26, 8/28 | Introduction , Java Generics, Interfaces | Chap 9 |
| 9/2, 9/4 | Heaps and Priority Queues | Chap 12 |
| 9/9, 9/11 | Heaps and Priority Queues | Chap 12 |
| 9/16, 9/18 | Binary Search Trees (Review), Balanced Trees | Chap 11, Chap 13.1 |
| 9/23, 9/25 | Balanced Trees | Chap 13.1 |
| 9/30,**10/2** | Balanced Trees | Chap 13.1 |
| 10/7 , 10/9 | Hashing | Chap 13.2 |
| 10/14, 10/16 | Hashing | Chap 13.2 |
| 10/21, 10/23 | Graphs | Chap 14 |
| 10/28, 10/30 | Graphs | Chap 14 |
| 11/4, **11/6** | Graphs | Chap 14 |
| 11/13 | Mergesort and Quicksort | Chap 10 |
| 11/18, 11/20 | External Methods | Chap 15 |
| 11/25 | External Methods, Intro to Database | Chap 15 |
| 12/2, **12/4** | Intro to Database |  |
| 12/9 | Final Project Due |  |

**Midterms Oct 2, Nov 6, Dec 4**

**See the class Moodle page for power points presentations, programming assignment postings and other information.**