

**1. Course number and name**

CptS 233: Advanced Data Structures Java

**2. Credits and contact hours**

3 credits, 3 lecture hours

**3. Instructor's or course coordinator's name**

Bolong Zeng

**4. Textbook, title, author, and year**

Mark Weiss. *Data Structures and Algorithm Analysis in Java* (3rd ed.). ISBN-10: 0132576279.

**5. Specific course information**

- a. *Catalog description:* Advanced data structures, object oriented programming concepts, concurrency, and program design principles taught in C/C++ programming language.
- b. *Prerequisites or corequisites:* C or above in CPT\_S 132; MATH 216 (concurrent enrollment OK)

**6. Specific goals for the course**

At the end of

- Analyze and compare a variety of data structures. (1b, 1c, 1d, 6b, 6c, 6d)
- Design efficient algorithms. (6a, 6b, 6c, 6d)
- Apply the knowledge gained in the class in order to solve real-world problems using different data structures and design techniques. (1a, 1b, 1c, 1d, 1e, 6a, 6b, 6c, 6d)
- Implement these solutions in Java and using Git for version control (7b, 7c, 7d, 7g)

**7. Brief list of topics to be covered**

- Using version control tools.
- Algorithm complexity
- Data structures and algorithms:
  - Hashtable
  - Tree: BST, AVL, Red-Black, B+, Huffman
  - Heap
  - Sorting
  - Graph