CSE 332 Data Structures

Credits
4.0 (3 hrs lecture, 1 hr section)

Lead Instructor
Ruth Anderson

Textbook
Data Structures & Algorithm Analysis in Java, Weiss

Course Description
Covers abstract data types and structures including dictionaries, balanced trees, hash tables, priority queues, and graphs; sorting; asymptotic analysis; fundamental graph algorithms including graph search, shortest path, and minimum spanning trees; multithreading and parallel algorithms; P and NP complexity classes. No credit if CSE 373 has been taken

Prerequisites
CSE 311

CE Major Status
Required

Course Objectives
communicate the representation and organization of data in terms of ubiquitous computing abstractions such as stacks, queues, trees, hash-tables, and graphs
analyze algorithms for correctness and efficiency, including the use of asymptotic analysis
design parallel programs that use extra computational resources to complete a task more quickly
recognize software errors related to concurrent execution of tasks such as race conditions
create software that implements classic data structures and algorithms and uses such algorithms appropriately

ABET Outcomes
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (H)
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors (H)
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions (H)
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. (H)

Course Topics

Review of simple abstract data-types (2 lecture hours)
Algorithm Analysis (1 lecture hour)
Asymptotic Analysis (2 lecture hours)
Priority Queues (2 lecture hours)
Dictionaries (5 lecture hours)
Sorting (3 lecture hours)
Graphs (4 lecture hours)
Parallel Programming (4 lecture hours)
Concurrent Programming (2 lecture hours)
P, NP, NP-Complete (1 lecture hour)