

CSCE 146 - Algorithmic Design II

Credit Hours: 4 hours

Contact Hours: 3 lecture hours and a two-hour lab

Instructor: Dr. Jeremiah Shepherd

Required Textbooks: Duncan Buell. *Data Structures and Algorithms Using Java*, Jones & Bartlett Learning, 2011.

Bulletin Description: Continuation of CSCE 145. Rigorous development of algorithms and computer programs; elementary data structures.

Prerequisites: C or better in CSCE 145 Prereq/Coreq: MATH 122 or MATH 141

Required Course in CE, CIS, and CS programs

Learning Outcomes: Students will be able to:

1. Develop structured, modular algorithms,
2. Implement correct programs in an object-oriented language,
3. Use and implement as classes data structures, such as sets, bags, sequences, stacks, queues, and binary trees,
4. Analyze the time and space complexity of simple algorithms,
5. Apply data abstraction and elementary concepts of object-oriented programming,
6. Implement moderately complex programs using an object-oriented language.

Student (Program) Outcomes addressed by course (Detailed mappings of these course outcomes to the Student Outcomes of the programs are in the detailed syllabus and the Assessment plan.)

Student Program Outcomes	SOs supported	SOs Moderately supported
Computer Engineering	a, c, e	b
Computer Information Systems	a, c	b, i, IS-j
Computer Science	a, c, CS-j, CS-k	b, i

Topics covered:

1. Overview of Object-Oriented Programming and Java (1 hour)
2. Error Handling, Software Testing, and Program Efficiency (5 hours)
3. Fundamental Data Structures: The Array and Linked Data Structures (5 hours)
4. A Basic Collection Class (3 hours)
5. The List Abstract Data Type (5 hours)
6. The Stack Abstract Data Type (5 hours)
7. The Queue Abstract Data Type (5 hours)
8. Recursion (7 hours)
9. Sorting and Searching (7 hours)
10. Trees (7 hours)
11. The Map ADT (2 hours)
12. Graphs (2 hours)