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 Using Java*, Jones & Bartlett Publishers, 2012.
- **Bulletin Description:** Continuation of CSCE 145. Rigorous development of algorithms and computer programs; elementary data structures.
- **Prerequisite:** C or better in CSCE 145
- **Prerequisite or Corequisite**: MATH 122 or MATH 141
- **Required Course** in CE, CIS, and CS
- **Course 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 Outcomes addressed by course**

Program	Student Outcomes Addressed
Computer Engineering	2, 7
Computer Information Systems	2
Computer Science	2, 6

- **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)