CSCE 350 - Data Structures and Algorithms Credit Hours: 3 hours
Contact Hours: 3 lecture hours
Instructor: Dr. Tong


Bulletin Description: Techniques for representing and processing information, including the use of lists, trees, and graphs; analysis of algorithms; sorting, searching, and hashing techniques.

Prerequisites: CSCE 240; MATH 174 or MATH 374 or MATH 574

Required Course in CE, CIS, and CS programs

Learning Outcomes: Students will be able to:
1. Describe formal analysis measures.
2. Describe the relevance of abstraction to problem solving.
3. Analyze and use lists, trees, and graphs.
4. Apply common algorithm design techniques such as brute force, divide-and-conquer, decrease-and-conquer, transform-and-conquer, dynamic programming, and the greedy technique.
5. Analyze algorithms.
6. Use appropriate data structures

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.)

<table>
<thead>
<tr>
<th>Student Program Outcomes</th>
<th>SOs supported</th>
<th>SOs Moderately supported</th>
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</thead>
<tbody>
<tr>
<td>Computer Engineering</td>
<td>a, e</td>
<td>b, c, h, j</td>
</tr>
<tr>
<td>Computer Information Systems</td>
<td>a, b, i</td>
<td>c, IS-j</td>
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<tr>
<td>Computer Science</td>
<td>a, b, i, CS-j, CS-k</td>
<td>c</td>
</tr>
</tbody>
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Topics covered:
1. Structured programming, stacks, queues, lists (3 hours)
2. Determining the Running Time of Programs, Order of Magnitude Analysis (6 hours)
3. Brute force (3 hours)
4. Divide-and-Conquer (4 hours)
5. Dynamic Programming (6 hours)
6. Transform-and-Conquer (4 hours)
7. The Greedy Technique (3 hours)
8. Decrease-and-Conquer (3 hours)
9. Graphs (3 hours)
10. Reviews and exams (4 hours)