CSCE 145 - Algorithmic Design I

Credit Hours: 4 hours
Contact Hours: 2 lecture hours and 2 two-hour labs
Instructor: Dr. Jeremiah Shepherd


Bulletin Description: Problem-solving, algorithmic design, and programming.

Corequisites: MATH 111 or MATH 115
Prerequisites: MATH 111 or MATH 115
Required Course: in CE, CIS, and CS programs

Learning Outcomes
Students will be able to:
1. Solve problems using a computer,
2. Read and design algorithms,
3. Design data structures,
4. Demonstrate the ability to use a software development environment to construct, execute, test, and debug software,
5. Demonstrate the ability to program a computer in a high-level language.

Student (Program) Outcomes addressed by course (detailed mapping is available)

<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>c, e, CE-k</td>
<td>a, b, i</td>
</tr>
<tr>
<td>Computer Information Systems</td>
<td>b, c</td>
<td>a, IS-j</td>
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<tr>
<td>Computer Science</td>
<td>b, c, CS-k</td>
<td>a, CS-j</td>
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</tbody>
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Topics covered:
1. Introduction to programming tools (1 hour)
2. Primitive data types, including strings (4 hours)
3. Flow of control (5 hours)
4. Classes, methods, and encapsulation (7 hours)
5. Method overloading and constructors (4 hours)
6. Arrays (4 hours)
7. Inheritance and polymorphism (6 hours)
8. Exceptions and exception handling (4 hours)
9. Input/output using streams and files (5 hours)
10. Graphical user interfaces (4 hours)
11. Applications such as robotics, digital signal processing, and website animation (7 hours)