COURSE DESCRIPTION

<table>
<thead>
<tr>
<th>Dept., Number</th>
<th>CS1101</th>
<th>Course Title</th>
<th>Introduction to Computer Science</th>
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</thead>
<tbody>
<tr>
<td>Approval Date</td>
<td>Sept. 2022</td>
<td>Course Coordinator</td>
<td>M. Ceberio</td>
</tr>
</tbody>
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CATALOG DESCRIPTION

First course for students majoring in Computer Science. Introduction to problem solving with computers, including representation, control structures, and software development methods; closed laboratory and programming assignments in a high-level language; programming environments; social and ethical aspects of computing.

TEXTBOOK

Revel for Introduction to Java Programming and Data Structures
By Y Daniel Liang

COURSE OUTCOMES

**Level 2. Application and Analysis:**

Level 2 outcomes are those in which the student can apply the material in familiar situations, e.g., can work a problem of familiar structure with minor changes in the details. Upon successful completion of this course, students will be able to:

1. Analyze problems, design, and implement solution algorithms, including correct use of:
   a) Simple I/O operations (reading from and printing to the terminal)
   b) User-defined types and their implementation as classes
   c) Basic string manipulation techniques using language functions, including:
      a. Traversing strings
      b. Accessing characters
      c. Comparing strings
      d. Concatenating strings
2. Algorithm-tracing techniques to ensure solution correctness including method calls
3. Use testing and debugging strategies to identify software faults by creating test suites that include:
   a) Black-box test cases
   b) Basic white-box test cases
4. Use general software engineering principles, including abstraction and problem decomposition in problem and solution analysis
5. Use informal pseudocode to describe algorithms
6. Use 2D arrays
7. Use recursion for solving simple problems
8. Instead of IDEs, use a command line interface (terminal) to compile and execute programs.
9. Use teamwork roles and strategies in the classroom

**Level 3. Synthesis and Evaluation:**

Level 3 outcomes are those in which the student can apply the material in new situations. This is the highest level of mastery. On successful completion of this course, students will be able to use the syntax and the semantics of a high-level language to express solution to programming problems, including the pseudocode correct use of:

1. Basic variable types including Booleans, integers, real numbers, characters, strings
2. 1D arrays
3. Assignment and arithmetic
4. Logical propositions to define conditional and loop statements
5. For-loops
6. While-loops
7. Methods/functions, parameter passing, and return values
8. Algorithmic building blocks including:
   a. Min
   b. Max
   c. Average
   d. Summation
   e. Linear search
9. Coding and documentation standards
### ABET STUDENT OUTCOMES MAPPING

<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Student Outcome</th>
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<tbody>
<tr>
<td>3.3, 3.4</td>
<td>1</td>
</tr>
<tr>
<td>2.2</td>
<td>2 (ABET 1)</td>
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<tr>
<td>2.1, 2.4 – 2.8, 3.1 – 3.8</td>
<td>3 (ABET 2)</td>
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<td>2.10</td>
<td>4 (ABET 5)</td>
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<td>5 (ABET 4)</td>
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<td>2.10</td>
<td>6 (ABET 3)</td>
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<td>7</td>
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<td>2.1, 2.9</td>
<td>8</td>
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<td>2.2, 2.3, 3.9</td>
<td>9</td>
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<td>10 (ABET 6)</td>
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### PREREQUISITES BY TOPIC

- **MATH 1508** or **MATH 1411** with "C" or better. CS1301 is a co-requisite.