COURSE DESCRIPTION

Dept., Number	CS 1301	Course Title	Intro to CS
Approval Date	April 2022	Course Coordinator	Daniel Mejia

CATALOG DESCRIPTION

Intro to Computer Science: Topics include basic concepts of algorithms, basic computer organization, impacts of computing, and implementation of solutions to computing problems in a high-level programming language. Students will build problem-solving skills, team skills, critical-thinking skills, and professionalism.

TEXTBOOK

Introduction to Java Programming and Data Structures, 13th Edition
Y. Daniel Liang

COURSE OUTCOMES

Learning Outcomes

Level 1: Knowledge and Comprehension. Level-1 outcomes are those in which the student has
been exposed to the terms and concepts at a basic level and can supply basic definitions. On successful completion of this course, students will be able to describe, at a high level:

1. The major advances in the history of computing
2. The relation between computing and society, including social, ethical, and legal issues
3. The importance of computing in a variety of professions: required knowledge and skill sets for major career options
4. Classes of programming languages, including:
   a. Imperative,
   b. Object oriented,
   c. Declarative, and
   d. Functional
5. The purpose of multi-dimensional arrays (dimension 3 and above)
6. The purpose of and relationship between classes and objects
7. The purpose of pre/post conditions, in particular as related to verification
8. Compilation and interpretation
9. Understand basic linked list representation and manipulation
10. Understand the use of hexadecimal and binary in problem solving and computer science in general

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. User-defined types and their implementation as classes
   b. Basic string manipulation techniques using language functions, including:
      i. Traversing strings,
      ii. Accessing characters,
      iii. Comparing strings,
      iv. 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

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 semantics of a high-level language to express solutions to programming problems, including the pseudocode correct use of:
1. Basic variable types including Booleans, integers, real numbers, characters, strings
2. 1-D 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, return values
8. Algorithmic building blocks including
   a. Min
   b. Max
   c. Average
   d. Summation
   e. Linear search

ABET STUDENT OUTCOMES MAPPING

Course Outcomes	Student Outcome
3.3, 3.4	1
2.2	2 (ABET 1)
2.1, 2.4 – 2.8, 3.1 – 3.8	3 (ABET 2)
	4 (ABET 5)

	5 (ABET 4)
	6 (ABET 3)
1.1, 1.2, 1.3	7
	8
1.4, 1.5, 1.6, 1.7	9
2.2, 2.3	10 (ABET 6)

PREREQUISITES BY TOPIC

MATH 1508 or MATH 1411 with a grade of C or better