

The University of Texas at El Paso
Course Syllabus

COURSE DESCRIPTION

Dept., Number	CS1101	Course Title	Introduction to Computer Science
Approval Date	Sept. 2020	Course Coordinator	M. Ceberio

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:

- 2.1. 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
 - d) Algorithm-tracing techniques to ensure solution correctness
- 2.2. 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
- 2.3. Use general software engineering principles, including abstraction and problem decomposition in problem and solution analysis
- 2.4. Use informal pseudocode to describe algorithms
- 2.5. Use 2D arrays
- 2.6. Apply binary arithmetic to solve problems. This includes:

- a) Conversion between binary, decimal, and hexadecimal numbers
- b) Application of arithmetic operations on binary and hexadecimal numbers
- 2.7. Use recursion for solving simple problems
- 2.8. Use linked lists
- 2.9. Instead of IDEs, use a command line interface (terminal) to compile and execute programs
- 2.10. 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, 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

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)
2.10	4 (ABET 5)
	5 (ABET 4)
2.10	6 (ABET 3)
	7
	8
2.1, 2.9	9
2.2, 2.3, 3.9	10 (ABET 6)

PREREQUISITES BY TOPIC

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