CSCI 1302 - COMPUTER SCIENCE PRINCIPLES

CREDIT HOURS: 3
PREREQUISITES: Eligibility for enrollment in college algebra.
GRADE REMINDER: Must have a C or better in each prerequisite course.

CATALOG DESCRIPTION

Fundamental concepts of computer systems, systems software, and an overview of computer science issues. Problem solving and program development using a high-level programming language.

PURPOSE OF COURSE

To introduce students to the basic concepts of computer systems, to fundamental systems software, to a disciplined approach to problem solving, to procedural program development in a high-level language, to software engineering principles, to ethics in computing, and to computer science careers.

EDUCATIONAL OBJECTIVES

Upon successful completion of the course, students should be able to:

1. Demonstrate a fundamental knowledge of computer organization, computer operation, and the information hierarchy.

2. Apply the software life cycle to specific problems in such disciplines as business, mathematics, science, and engineering.

3. Perform problem analysis and program design using tools such as pseudocode, structure charts, and flowcharts.

4. Apply the features of a modern widely-used programming language in implementing solutions to well described problems. These features include declaration of data types and fundamental data structures, application of control structures (sequence, selection, repetition), utilization of I/O and file handling, development of structured program organization (subprograms with parameters), and inclusion of documentation.

5. Use operating systems tools (command system, editor, compiler, linker and loader) in single-user and/or multi-user environments.

6. Create appropriate test data and apply debugging and testing strategies.

7. Demonstrate a knowledge of fundamental computing terminology.

8. Demonstrate an understanding of the role of computing in society, including ethics, security, and privacy.

COURSE CALENDAR

This course meets for a minimum of 37.5 lecture contact hours during the semester. Students have significant weekly reading assignments. Students are expected to complete weekly homework/programming assignments, and 2-3 periodic exams in addition to the final exam. Students are expected to prepare for any class assignments or quizzes over the material covered in class or in the reading material. Successful completion of these activities requires at a minimum 6 additional hours of outside of classroom work each week.

CONTENT **Hours**

Introduction to computer science 1

Basic Concepts of Computer Systems 2
- Architectural overview
- Data storage and representation
- Computing environments
- Computer languages

Systems Software 5
- Operating systems, editors, compilers
- Program linking, loading, and execution

Problem Solving Concepts 9
- Strategies for problem solving
- Algorithm representation

Program Development 19
- Use of a high-level programming language to solve simple problems on a computer
- Programming language concepts and features: primitive data types, expressions and operations, functions and parameters, fundamental control structures, one-dimensional arrays, text files

Software Engineering Principles 3
- Life Cycle and Development Process
- Modular design and communication
- Documentation

Ethics, Careers, Security, and Privacy 3

Exams 3

TOTAL 45

REFERENCES

Horstmann, C., Java Concepts: Late Objects 3rd edition, Wiley, 2016.

Liang, Y.D., Introduction to Java Programming, Prentice Hall, 11th Ed., 2018.

Malik, D.S., Java Programming from Problem Analysis to Program Design, Course Technology, 5th Ed., 2012.