

CSC 102 - COMPUTER SCIENCE PRINCIPLES

CREDIT HOURS: 3
PREREQUISITES: Two years of high school algebra or equivalent.
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 (binary numbers and character representations).
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. Use E-mail, networks, and the Internet.
8. Demonstrate a knowledge of fundamental computing terminology.
9. Demonstrate an understanding of the role of computing in society.

CONTENT

Hours

Introduction to computer science	1
Basic Concepts of Computer Systems	3
Architectural overview	
Data storage and representation	
Computing environments	
Computer languages	

Systems Software	6
Operating systems, editors, compilers	
Program linking, loading, and execution	
The Internet and electronic mail	
Problem Solving Concepts	9
Strategies for problem solving	
Algorithm representation	
Program Development	18
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 and Careers	2
Exams	3
	TOTAL 45

REFERENCES

- Deitel, H., and Deitel, P., C++ How To Program, Prentice Hall, 4th Ed., 2003.
- Dann, W.P., Cooper, S., Pausch, R. Learning to Program with Alice, Prentice Hall, 2006.
- Liang, V.D., Introduction to Java Programming, Prentice Hall, 6th Ed., 2007.