

CSC 442 - ORGANIZATION OF PROGRAMMING LANGUAGES

CREDIT HOURS: 3

PREREQUISITES: CSC 241; CSC 323 or 342 or 343

GRADE REMINDER: Must have a grade of C or better in each prerequisite course

CATALOG DESCRIPTION

Language definition, structure, data types, control structures, parameter passage, subprogram interface, block structured language. Information binding, data storage and mapping, execution environments, input/output, recursion, multiprocessing.

PURPOSE OF COURSE

To bring to focus the basic and specialized aspects of programming language (PL) constructs and concepts. A variety of PLs are studied and used to illustrate the major PL paradigms. Students will write programs in selected PLs.

EDUCATIONAL OBJECTIVES

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

1. Describe the significant commonly-accepted criteria for evaluating programming languages (PLs).
2. Identify a large variety of design issues associated with many different PL features.
3. Describe PL design principles.
4. Describe evolutionary progress of the major PLs.
5. Describe the PL paradigms—imperative (procedural), object-oriented, functional (applicative), and logic (declarative).
6. Identify many of the constructs and concepts of a number of PLs in all the paradigms.
7. Work with fellow team members to learn a new PL, write illustrative programs in the assigned PL, develop a hardcopy tutorial for the PL, and make a presentation of the tutorial using multimedia.

CONTENT

Hours

Preliminary Considerations about PLs	3
Evaluation Criteria	
Design Influences	
Evolution	
PL Constructs and Concepts:	
Syntax and Semantics	
Names, Bindings, Type Checking, and Scopes	
Structured Data Types and Pointers	
Expressions and the Assignment Statement	

Statement-Level Control Structures

Subprograms

Data Abstraction

Concurrency

Exception Handling

- In Imperative PLs 15
Traditional (Fortran 77, COBOL); block-structured (Pascal, C, Ada, Fortran 90, C++)
 - In Object-Oriented PLs (Smalltalk, C++, Java) 12
- In Functional PLs (LISP, ML, Haskell, SCHEME) 6
- In Logic PLs (Prolog) 6

Exams (plus Final) 3

TOTAL 45

REFERENCES

Pratt, T., and Zelkowitz, M., Programming Languages, Design and Implementation, 4th Ed., Prentice Hall, 2001.

Sebesta, R.W., Concepts of Programming Languages, 7th Ed., Addison-Wesley, 2005.

Sethi, R., Programming Languages: Concepts and Constucts, 2nd Ed., Addison-Wesley, 1996.

Tucker, A., and Noonan, R., Programming Languages: Principles and Paradigms, McGraw-Hill, 2002.