

II/IV B. TECH. SECOND SEMESTER
PRINCIPLES OF PROGRAMMING LANGUAGES(Required)

Course Code : CS4T4

Credits: 3

Lecture: 3 periods/ week

Internal assessment: 30 Marks

Tutorial: 1period/week

Semester end examination: 70 Marks

Prerequisites: Program Design

Course Objectives:

1. Increased capacity to express ideas.
2. Improved knowledge in choosing appropriate languages.
3. Increased ability to learn new languages.
4. Understand the differences between different programming paradigms.
5. Increased capacity to develop programs in different programming languages.

Course Outcomes:

At the end of this course student will:

CO1) Understand the architecture and implementation methods of Programming languages

CO2) Design parse trees for syntax and semantics of programming languages.

CO3) Understand characteristics and features of various data types and control structures in programming languages

CO4) Illustrate the modularity in programs with different parameter passing techniques

CO5) Describe the features of logical & functional programming languages

Syllabus:

UNIT 1

Preliminary Concepts: - Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Language Implementation – Compilation and Virtual Machines, programming environments.

UNIT 2

Syntax and Semantics: - general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, dynamic semantics

UNIT 3

Data types: - Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

UNIT 4

Expressions and Statements:- Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, and guarded commands.

UNIT 5

Subprograms and Blocks:- Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, co routines.

Functional Programming Languages: - Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

Learning Resource

Text Books

1. Concepts of Programming Languages, Robert .W. Sebesta 6/e, Pearson Education.
2. Programming Languages –Louden, Second Edition, Thomson

References

1. Programming languages –Ghezzi, 3/e, John Wiley
2. Programming Languages Design and Implementation – Pratt and Zelkowitz, Fourth Edition PHI/Pearson Education
3. Programming languages –Watt, Wiley Dreamtech