IV B.Tech – II Semester
(17CS833) PRINCIPLES OF PROGRAMMING LANGUAGES (Professional Elective-IV)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	1	-	3

Pre-Requisites: C,C++, PYTHON

Course Objectives:

- To understand and describe syntax and semantics of programming languages
- To understand data, data types, and basic statements
- To understand call-return architecture and ways of implementing them
- To understand object-orientation, concurrency, and event handling in programming languages
- To develop programs in non-procedural programming paradigms

UNIT-I: Syntax and semantics: Evolution of programming languages, describing syntax, context, free grammars, attribute grammars, describing semantics, lexical analysis, parsing, recursive - decent bottom - up parsing

UNIT-II: Data, data types, and basic statements: Names, variables, binding, type checking, scope, scope rules, lifetime and garbage collection, primitive data types, strings, array types, associative arrays, record types, union types, pointers and references, Arithmetic expressions, overloaded operators, type conversions, relational and boolean expressions , assignment statements , mixed mode assignments, control structures – selection, iterations, branching, guarded Statements

UNIT-III: Subprograms and implementations: Subprograms, design issues, local referencing, parameter passing, overloaded methods, generic methods, design issues for functions, semantics of call and return, implementing simple subprograms, stack and dynamic local variables, nested subprograms, blocks, dynamic scoping

UNIT-IV: Object- orientation, concurrency, and event handling: Object – orientation, design issues for OOP languages, implementation of object, oriented constructs, concurrency, semaphores, Monitors, message passing, threads, statement level concurrency, exception handling, event handling

UNIT-V: Functional programming languages: Introduction to lambda calculus, fundamentals of functional programming languages, Programming with Scheme, – Programming with ML,

UNIT-VI: Logic programming languages: Introduction to logic and logic programming, – Programming with Prolog, multi - paradigm languages

Course Outcomes:

CO1	Describe syntax and semantics of programming languages	**L4**
CO2	Explain data, data types, and basic statements of programming languages	**L1**
CO3	Design and implement subprogram constructs, Apply object - oriented, concurrency, and event handling programming constructs	**L2**
CO4	Develop programs in Scheme, ML, and Prolog	**L2**
CO5	Understand and adopt new programming languages	**L2**

Text Books:

1. Robert W. Sebesta, “Concepts of Programming Languages”, Tenth Edition, Addison Wesley, 2012.
2. Programming Langugaes, Principles & Paradigms, 2ed, Allen B Tucker, Robert E Noonan, TMH

Reference Books:

1. R. Kent Dybvig, “The Scheme programming language”, Fourth Edition, MIT Press, 2009.
2. Jeffrey D. Ullman, “Elements of ML programming”, Second Edition, Prentice Hall, 1998.
3. Richard A. O'Keefe, “The craft of Prolog”, MIT Press, 2009.
4. W. F. Clocksin and C. S. Mellish, “Programming in Prolog: Using the ISO Standard”, Fifth Edition, Springer, 2003