Department of Computer Science and Engineering
National Institute of Technology Tiruchirappalli

1. Course Outline			
Course Title	Principles of Programming Languages		
Course Code	CSPC23		
Department	CSE	**No. of Credits**	3
Pre-requisites Course Code	NIL	**Faculty Name**	Mr.A.SanthanaVijayan Ms. L. Priya
E-mail	vijayana@nitt.edu	**Telephone No.**	0431 - 2503217
Course Type	Core Course		

2.Course Overview

Principles of Programming Languages mainly describes about the syntax, semantics and implementation of various programming language paradigms.

3. 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

4. Course Outcomes (CO)

- Describe syntax and semantics of programming languages
- Explain data, data types, and basic statements of programming languages
- Design and implement subprogram constructs
- Apply object-oriented, concurrency, and event handling programming constructs
- Develop programs in Scheme, ML, and Prolog
- Understand and adopt new programming languages

5. Course Outcome (CO)	**Aligned Programme Outcome (PO)**							
	PO-1	**PO-2**	**PO-3**	**PO-4**	**PO-5**	**PO-6**	**PO-7**	**PO-8**
Describe syntax and semantics of programming	S	B	M	M	B	M	B	M
Explain data, data types, and basic statements of programming languages	S	B	M	B	M	B	B	M
Design and implement subprogram constructs	M	B	S	S	M	M	M	B

Apply object-oriented, concurrency, and event handling programming constructs	S	M	M	M	S	B	M	M
Develop programs in Scheme, ML, and Prolog	S	M	M	M	B	M	M	B
Understand and adopt new programming languages	M	M	B	B	S	B	M	B

S = 0.6 M = 0.4 B = 0.0

6. Course Teaching and Learning Activities

L.No	Title	Type		Mode of delivery			
		L	T	C& T	PPT	VL/VC	DEMO
	UNIT I						
1.	Evolution of programming languages – describing syntax & semantics	√		√			
2.	Lexical analysis –Parsing –recursive-decent –bottom up parsing	√		√			
3.	Primitive data types –strings	√		√			
4.	Array types associative arrays –record types	√		√			
5.	Union types –Pointers and references	√		√			
6.	Arithmetic expressions –relational and Boolean expressions	√		√			
7.	Assignment statements	√		√			
8.	Mixed-mode assignments	√		√			
9.	Control structures –Selection –Iterations	√		√			
10.	Branching –guarded statements	√		√			
11.	Programming Assignments						√
	UNIT II						
12.	Subprograms –Design issues	√		√			
13.	Local referencing –Parameter passing	√			√		
14.	Overloaded methods –generic methods	√		√	√		
15.	Design issues for functions	√		√			
16.	Semantics of call and return –implementing simple subprograms	√		√	√		
17.	Dynamic local variables –Nested subprograms	√			√		
18.	Blocks –Dynamic scoping	√		√			
19.	Programming Assignments						√
	UNIT III						
20.	Object-orientation –design issues for OOP languages	√					

21.	Implementation of object-oriented constructs –Concurrency	√		√	√		
22.	Semaphores	√		√	√		
23.	Monitors	√			√		
24.	Message passing	√		√			
25.	Threads –statement level concurrency	√		√	√		
26.	Exception handling –Event handling	√		√			
27.	Programming Assignments in C++						√
UNIT IV							
28.	Introduction to lambda calculus	√		√	√		
29.	Fundamentals of Functional programming languages	√			√		
30.	Programming with Scheme –Introduction to LISP	√		√			
31.	Lists - Storage allocation for lists	√		√			
32.	Some useful functions - Error handling	√		√	√		
33.	Programming Assignments in LISP						√
UNIT V							
34.	Introduction to logic and logic programming-	√		√	√		
35.	Computing with relations	√			√		
36.	Programming with Prolog - Intoduction	√		√	√		
37.	Data structures in Prolog	√		√			
38.	Programming techniques - Control in Prolog	√		√	√		
39.	Cuts .– Multi-paradigm languages	√			√		
40.	Programming Assignments in PROLOG						√

7. Course Assessment Methods				
Sl. No.	**Mode of Assessment**	**Week/Date**	**Duration**	**Marks**
1	Cycle Test – 1	6^{th} week	1 hour	20
2	Cycle Test – 2	12^{th} week	1 hour	20
3	Assignment	4^{th}, 10^{th} weeks	_	10
4	End Semester Exam	November 2^{nd} week	3 hours	50
			Total	100

8. Essential Readings (Textbooks, Reference books, Websites, Journals, etc.)

Text Books

- Robert W. Sebesta, "Concepts of Programming Languages", Tenth Edition, Addison Wesley, 2012.
- Michael L. Scott, "Programming Language Pragmatics", Third Edition, Morgan Kaufmann,2009.
- R. Kent Dybvig, "The Scheme programming language", Fourth Edition, MIT Press, 2009.
- Jeffrey D. Ullman, "Elements of ML programming", Second Edition, Prentice Hall, 1998.
- Richard A. O'Keefe, "The craft of Prolog", MIT Press, 2009.
- W. F. Clocksin and C. S. Mellish, "Programming in Prolog: Using the ISO Standard", Fifth Edition, Springer, 2003.

For Senate's Consideration

(L.PRIYA)	(C. MALA)	(S. SELVAKUMAR)
Course Faculty	Class Committee Chairperson	HoD

For Senate's Consideration

(Mr. A. SANTHANAVIJAYAN)

(Ms. L. PRIYA)	**(Dr. N. RAMASUBRAMANIAN)**	**(Dr. R. LEELA VELUSAMY)**
Course Faculty	Class Committee Chairperson	HOD