Principles of Programming Languages (3 – 0 – 1)

Evaluation:

	Theory	Practical	Total
Sessional	30	20	50
Final	50	-	50
Total	80	20	100

Course Objectives:
The objective of this course is to provide a student with adequate knowledge on fundamentals and necessary theoretical backgrounds of various programming languages and their pragmatic structure.

Course Contents:

1. **Evolution of Programming Languages** — **5 hrs**
   - 1.1 Importance of Study
   - 1.2 History and Motivation
   - 1.3 Characteristics of a good language
   - 1.4 Design of a pseudo code, implementation
   - 1.5 Phenomenology of Programming Languages

2. **Emphasis on Efficiency - *FORTRAN*** — **10 hrs**
   - 2.1 History and Motivation
   - 2.2 Structural Organization
   - 2.3 Control Structure
   - 2.4 Data Structure
   - 2.5 Name Structure
   - 2.6 Syntactic structure.

3. **Generality and Hierarchy - *ALGOL-60*** — **10 hrs**
   - 3.1 History and Motivation
   - 3.2 Structural Organization
   - 3.3 Control Structure
   - 3.4 Data Structure
   - 3.5 Name Structure
   - 3.6 Syntactic structure
   - 3.7 Descriptive tools(BNF)
   - 3.8 Elegance.

4. **List Processing and Functional Programming - *LISP*** — **10 hrs**
   - 4.1 History and Motivation
   - 4.2 Structural Organization
   - 4.3 Control Structure
   - 4.4 Data Structure

4.5 Name Structure
4.6 Syntactic structure
4.7 Recursive Interpreters
4.8 Storage Reclamation.

5. **Object Oriented Programming - *Small Talk*** **10 hrs**
   5.1 History and Motivation
   5.2 Structural Organization
   5.3 Classes and Subclasses
   5.4 Objects and Message Sending
   5.5 Classes and Objects
   5.6 Object oriented Extensions.

Laboratory Works:
The laboratory works consists of compiling and running programs in different programming languages like FORTRAN, LISP etc., designing and implementing different data structures and understanding the evolution of those constructs, comparing different programs developed in multiple languages and compare the time and space complexity.

Text Book:
Maclennan J. Bruce, *Principles of Programming Languages*, 3rd Edition, Oxford University Press, 1999; ISBN 0-19-511306-3

References:

1. Appleby, D., Vandekpllle, J. J., *Programming Languages*, 2E. McGraw -Hills, International Edition, 1997, ISBN 0-070005315-4.
2. Friedman P. Daniel, et all, *Essentials of Programming Languages*, PHI, 1998, ISBN-81-203-1355-0