

AMTC02 PRINCIPLES OF PROGRAMMING

UNIT-1 LANGUAGES DESIGN ISSUES

- 1.1 Why Study Programming Languages? A Short History of Programming Languages-
- 1.2 Development of Early Languages, Evolution of Software Architectures,
- 1.3 Application Domains, Role of Programming Languages-
- 1.4 What makes a Good Languages? Language Paradigms; Language Standardization;
- 1.5 Internationalization, Programming Environments- Effects on Language Design;
- 1.6 Environment Frameworks; Job Control and Process Languages, C Overview.

UNIT-2 IMPACT OF MACHINE ARCHITECTURES

- 2.1 Virtual Computers and Language Implementations,
- 2.2 Hierarchies of Virtual Machines, Binding and Binding Time, Java Overview.

UNIT-3 ELEMENTARY DATA TYPES

- 3.1 Data Objects; Variables; and Constants, Data types, Declarations,
- 3.2 Type Checking and Type Conversion, Assignment and Initialization, Numerical Data Types ,
- 3.3 Enumerations, Booleans, Characters, Character Strings,
- 3.4 Pointers and Programmer-Constructed Data Objects, Files and Input-Output.

UNIT-4 ENCAPSULATION

- 4.1 Structured Data Objects and Data Types,
- 4.2 Specification of Data Structure Types, Implementation of Data Structure Types,
- 4.3 Declaration and Type Checking for Data Structures, Vectors and Arrays,
- 4.4 Records, Lists, Sets, Executable Data Objects, Evolution of the Data Type Concept,
- 4.5 Information Hiding, Subprograms as Abstract Operations,
- 4.6 Subprogram Definition and Invocation, Subprogram Definitions as Data Objects.

UNIT-5 INHERITANCE

- 5.1 Abstract Data Types Revisited, Derived Classes, Methods,
- 5.2 Abstract Classes, Smalltalk Overview, Objects and Messages,
- 5.3 Abstraction Concepts, Polymorphism.

UNIT-6 SEQUENCE CONTROL

- 6.1 Implicit and Explicit Sequence Control,
- 6.2 Sequencing with Arithmetic Expressions
- 6.3 Tree Structure Representation; Execution-Time Representation,
- 6.4 Sequence Control between Statements - Basic Statements;
- 6.5 Structured Sequence Control; Prime Programs.

UNIT-7 SUBPROGRAM CONTROL

- 7.1 Simple Call-Return Subprograms, Recursive Subprograms,
- 7.2 The Pascal Forward Declaration, Names and Referencing Environments,

- 7.3 Static and Dynamic Scope, Block Structure,
7.4 Local Data and Local Referencing Environments, Actual and Formal Parameters,
7.5 Methods for Transmitting Parameters, Transmission Semantics, Implementation of Parameter Transmission.

Reference Books:

1. A Formal Semantics of Programming Languages: An Introduction by Glynn Winskel
2. Foundations for Programming Languages by John C Mitchell
3. Programming Languages: Concepts and Constructs by Ravi Sethi

