

NIRMA UNIVERSITY

Institute:	Institute of Technology
Name of Programme:	BTech (CSE)
Course Code:	3CS514ME24
Course Title:	Contemporary Programming
Course Type:	Department Elective-II
Year of Introduction:	2024-25

L	T	Practical Component				C
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Course Learning Outcomes (CLO):

At the end of the course, the students will be able to –

1. classify the major programming paradigms (BL2)
2. identify building blocks for various contemporary programming languages (BL3)
3. defend the principles and techniques involved in the design and implementation of modern programming languages (BL5)
4. develop hands-on skills in contemporary programming languages. (BL6)

Unit	Contents	Teaching Hours (Total 45)
Unit-I	Introduction to Contemporary Languages: Role of programming languages, towards high-level programming languages, problems of Scale, programming paradigms, Language implementation. The need for structured programming, syntax-directed control flow, design considerations	05
Unit-II	Basics of GO: Introduction to GO programming, data types, variables, constants, decision making, looping, functions, arrays, pointers, structures, slice, maps, range, error handling, strings, basics of module and tools	10
Unit-III	Kotlin Programming Language: Introduction to Kotlin programming, data types, variables, control flow, class and objects, functions, Basic of App development using Kotlin, an overview of the standard library, multiplatform development, and tools	10
Unit-IV	Swift Programming Language: Overview of Swift, Swift Environment, Data Types, Control Flow, Functions, Closures and Collections, Enumerations and Structures, OOPs, Applications	10
Unit-V	R Programming: Overview, Environment Setup, Basic Syntax, Data Types, Variables, Operators, Decision Making, Loops, Functions, Strings, Vectors, Lists, Matrices, Arrays, Factors, Data Frames, Packages, Data Reshaping, File Handling, Error Handling, Data Interfaces, Data Visualisation, basics of R Charts & Graphs and R Statistics	10

Self-Study:

The self-study contents will be declared at the commencement of the semester. Around 10% of the questions will be asked from self-study contents



Suggested Readings/ References:

1. Sethi R., Programming Languages concepts & constructs, Pearson Education
2. Alan A. A. Donovan, Brian W. Kernighan, The Go Programming Language, O'Reilly
3. Dawn Griffiths, David Griffiths, Head First Kotlin, O'Reilly
4. Aaron Hillegass and Christian Keur, iOS Programming, The Big Nerd Ranch Guide
5. Tilman M. Davies, The Book of R: A First Course in Programming and Statistics, No Starch Press

Suggested List of Experiments:

Sr. No.	Title	Hours
1	Introduction to Contemporary Programming Languages, Syntax Implementation	02
2	Basics of Go language building blocks	02
3	Develop Golang programs to compare the equality of struct, slice, and map	02
4	Basics of Kotlin Language.	04
5	Application Development using Kotlin Language	04
6	Understand the swift framework	02
7	Basics of Swift Language.	04
8	Application Development using Swift Language	02
9	Learn basics of R Language.	04
10	Data Analysis using R	04