DEPARTMENT OF COMPUTER SCIENCE
VALUE ADDED COURSE

Semester	Course Code	Course Title	Hours
III	22UCSVAC1	ANDROID PROGRAMMING	30

Course Outcomes

After completing the course, the students are able to

CO1: Understand the concept of Android

CO2: Understand how Widgets are applied

CO3: Impart the knowledge on Menus

CO4: Learn the concept of Google Firebase

CO5: Publish your Android application

UNIT I - Introduction to Android   **6 Hours**

Android Introduction– Versions – Internals – Architecture – Android Studio Download & Installation – Life Cycle

UNIT II –Basic Widgets   **6 Hours**

Button – Edit Text – Text View – Moving to next activity – Check Box – Radio Button

UNIT III–Menu   **6 Hours**

Option menu - Context menu - Sub menu - menu from xml - menu via code - Examples

UNIT IV – Google Firebase   **6 Hours**

Introduction – How to connect Android App to Google Firebase – How to Authenticate using Email

UNIT V –Publish   **6 Hours**

Publishing Android Application

Text Book

1. Study material prepared by Department of Computer Science, JMC

Semester	Course Code	Course Title	Hours
V	22UCSVAC2	FUNDAMENTAL OF MATLAB	30

Course Outcomes

After completing the course, the students are able to

CO1: Understand the basic mathematical concepts of matrices

CO2: Develop program for solving numerical computations

CO3: Develop small projects using GUI

CO4: Understand Image Processing functions in MATLAB

CO5: Impart the knowledge of MATLAB programming

UNIT-I   **6 Hours**

Introduction to MATLAB: Brief Introduction-Installation of MATLAB-History- Use of MATLAB-Key features- MATLAB software: Introduction to MATLAB Software-MATLAB-window Command-window Workspace-Command history-Setting directory-Working with the MATLAB- user interface- Basic commands-Assigning variables-Operations with variables

UNIT-II   **6 Hours**

Data files and Data types: Character and string- Arrays and vectors -Column vectors-Row vectors Basic Mathematics: Arithmetic operations-Operators and special characters-Mathematical and logical operators-Solving arithmetic equations-Operations on matrix-Creating rows and column Matrices

UNIT-III   **6 Hours**

Matrix operations: Finding transpose-determinant and inverse-Solving matrix Other operations - Trigonometric functions - Complex numbers – fractions - Real numbers - Complex numbers - M files: Working with script tools -Writing Script file - Executing script files - The MATLAB Editor - Saving m files

UNIT-IV   **6 Hours**

Plots: Plotting vector and matrix data - Plot labelling, curve labelling and editing. 2D plots: Basic Plotting Functions - Creating a Plot - Plotting Multiple Data Sets in One Graph - Specifying Line Styles and Colors - Graphing Imaginary and Complex Data - Figure Windows

UNIT-V   **6 Hours**

MATLAB Programming: Automating commands with scripts - Writing programs with logic and flow control - Writing functions - Control statement Programming - Conditional Statement Programming - Examples - Loops and Conditional Statements: Control Flow: Conditional Control — if, else, switch Loop Control: for, while, continue, break Program Termination: return

Text Books:

1. S. Swapna Kumar and Lenina S V B, MATLAB *Easy way of Learning,* PHI Learning Pvt. Ltd.
First Edition, 2016
2. Syed NasimulAlam and Syed SamsulAlam, Understanding MATLAB A *Text Book for Beginners*, I.K International Publishing House Pvt. Ltd., First Edition, 2013

Semester	Course Code	Course Title	Hours
III	22PCSVAC1	BASICS OF IMAGE PROCESSING	30

Course Outcomes

After completion of the course the students will be able to

CO1: Know the basic concepts of digital image processing
CO2: Understand the fundamentals of image representation in MATLAB
CO3: Acquire the knowledge for using loops, functions and commands in MATLAB
CO4: Apply the 2-D and 3-D graphics in real world applications
CO5: Implement the image processing methods

UNIT – I   **6 Hours**

Introduction: Digital Image Processing –The MATLAB working environment- Digital Image Representation-Reading, Writing and Displaying Images – Data classes- Image Types-Converting between Data Classes and Image Types – Array Indexing

UNIT – II   **6 Hours**

M-Function Programming: M-Files – Operators – Variables and Constants- Flow Controls - if,else and elseif - for loop – while loop –break and continue – switch - Code Optimization-Vectorizing loops-Preallocating Arrays-Interactive I/O

UNIT –III   **6 Hours**

Functions - Writing user defined functions- Built in Function-Function calling- Return Value - Types of Functions- Global Variables-String-Cell Arrays and Structures- Simple programs

UNIT –IV   **6 Hours**

MATLAB Graphics: Plots, Plot labeling, curve labeling and editing - Figure Windows - Displaying Multiple Plots in One Figure – Subplots - Introduction Of Graphical User Interface - 2D Graphics-3D Graphics-Animation-Sphere and Cylinder commands

UNIT – V   **6 Hours**

MATLAB Commands forImage Enhancement Techniques - Filtering Images - Image RestorationTechniques - Feature Extraction using Segmentation and Edge Detection – Color Image Processing

Text Book

1. R.C. Gonzalez, R.E. Woods and S.L. Eddins, Digital Image Processing usingMatlab, Pearson Education Inc.. 2012.

DEPARTMENT OF COMPUTER APPLICATIONS
VALUE ADDED COURSE

Semester	Course Code	Course Title	Hours
III	22UCAVAC1	FUNDAMENTAL OF R PROGRAMMING	30

Course Outcomes

After completion of the course, the students will be able to

CO1: Acquire basic knowledge in R

CO2: Understand the various data types available in R

CO3: Evaluate the use of Decision making and Looping statements

CO4: Describe the concept of Vectors and Lists

CO5: Apply the features of R in problem solving

UNIT – I   **6 Hours**

Overview: Evolution of R – Features of R – **Environment Setup**– Installation – **Basic Syntax:** R Command Prompt - R Script File – Comments

UNIT – II   **6 Hours**

Data Types: Vectors – Lists – Matrices – Arrays – Factors – Data Frames. **Variables:** Variable Assignment – Data Types of variable – Finding Variables – Deleting Variables   **R – Operators:** Arithmetic – Relational – Logical – Assignment – Miscellaneous

UNIT – III   **6 Hours**

Decision Making: If Statement – If…Else Statement – else if Statement – Switch Statement – **Loops:** Repeat – While – For – Break Statement – Next Statement

UNIT – IV   **6 Hours**

Functions: Definition – Components – Built-in Function – User-defined Function – Calling a Function – **Strings:** Rules Applied in String Construction – String Manipulation – **Vectors:** Vector Creation – Accessing Vector Elements - Vector Manipulation – **Lists:** Creating – Naming – Accessing – Manipulating – Merging – Converting List to Vector

UNIT – V   **6 Hours**

Matrices: Accessing Elements – Matrix Computations – **Arrays:** Naming Columns and Rows – Accessing and Manipulating – Calculations across Elements

Text Books:

1. SandipRakshit, R for Beginners, McGraw Hill Education, 2017
2. A.K. Verma, R Programming, Cengage Publications, 2019

Semester	Course Code	Course Title	Hours
V	22UCAVAC2	KOTLIN PROGRAMMING	30

Course Outcomes

After completion of the course the students will be able to

CO1: Acquire basic knowledge in Kotlin

CO2: Understand the various data types available in Kotlin.

CO3: Evaluate the use of conditional statements

CO4: Describe the concept of arrays and control structures

CO5: Apply functions in problem solving

UNIT – I   **6 Hours**

Kotlin Home– Introduction to Kotlin - Need of Kotlin – **Kotlin Get Started:** IDE – Installation

UNIT – II   **6 Hours**

Syntax - **Output:** The Print() Function –**Comments:** Single-line comments – Multi-line comments – **Variables:** Variable Type – *val*keyword – Display variables – Variable Names - **Data Types:** Numbers – Integer – Floating Point – Booleans – Characters – Strings – Arrays – Type Conversion

UNIT – III   **6 Hours**

Operators: Arithmetic – Assignment – Comparison – Logical – **Strings** – **Booleans:** Values - Expressions – **If…Else** – **When** – **Loops:** While – The Do..While – Break and Continue

UNIT – IV   **6 Hours**

Arrays: Access the Elements – Change an Array Element – Array Length / Size – Loop Through an Array - For Loop – **Ranges** – **Functions:** Predefined Functions – Creating User Defined Function - Function Calling – Function Parameters – Returning a Value

UNIT – V   **6 Hours**

Kotlin OOP: Classes and Objects – Constructors – Class Functions – Inheritance

Text Book

1) John Horton, *"Android Programming with Kotlin for Beginners"*, Packt Publishing, 2019

Semester	Course Code	Course Title	Hours
III	22MCAVAC1	ANGULAR JS	30

Course Outcomes

After completing the course, the students are able to

CO1: Understand the concept of Angular JS

CO2: Understand expressions and Directives of Angular JS

CO3: Impart the knowledge on Controllers and Modules

CO4: Learn the concept of scopes in Angular JS

CO5: Understand the concept of Forms in Angular JS

UNIT – I: **6 Hours**

Introduction to Angular JS – Need for Angular JS – Angular JS MVC – Angular JS First app – Angular JS Data Binding

UNIT – II: **6 Hours**

Expressions – Numbers, Strings, Objects, Arrays – Examples – Directives – ng-app, ng-init, ng-model, ng-repeat – Examples

UNIT – III: **6 Hours**

Controllers – Examples – Modules –Module Creation – Adding controller to a module – Adding directive to a module – Examples

UNIT – IV: **6 Hours**

Scopes – Examples – Filters – Adding filters to expressions – Adding filters to directives – Examples

UNIT – V: **6 Hours**

Forms – Check Box – Radio Buttons – Select Box – Examples – Animations – Examples

Text Book

1. ValeriKarpov, Diego Netto, "*Professional AngularJS*", Wrox Publication, First Edition, 2015

DEPARTMENT OF INFORMATION TECHNOLOGY
VALUE ADDED COURSE

Semester	Course Code	Course Title	Hours
III	22UITVAC1	PL/SQL PROGRAMMING	30

Course Outcomes

After completion of the course the students will be able to

CO1: Learn and create the structure of PL/SQL blocks

CO2: Recall variables and use a variety of variable types to handle data in a block

CO3: Apply loop control structures in a block

CO4: Create and use procedures and functions

CO5: Understand the use of cursors and triggers for data selections

UNIT – I 6 Hours

Introduction to PL/SQL - Architecture of PL/SQL- PL/SQL Developer - SQL Vs PL/SQL Vs T-SQL - Advantages and Disadvantages of PL/SQL-PL/SQL Block Structure- Simple and Anonymous Blocks

UNIT – II 6 Hours

PL/SQL Data Types : Numeric, Boolean, Date time and Interval -PL/SQL Variables Naming Convention – Variable Scope-PL/SQL Literals-PL/SQL Operators - PL/SQL Collections-Varrays - Nested & Index-by Tables- PL/SQL Records Type

UNIT –III 6 Hours

PL/SQL Conditions: if-then, if-then-else Statements- elsif, nested-if statements - PL/SQL Case Statement-PL/SQL Loops: for loop and while loop-Nested Loops-Strings-Simple example programs

UNIT –IV 6 Hours

PL/SQL Procedures: Creating and executing procedures- PL/SQL Functions-Creating and calling functions- Exception Handling-Examples to Raise User-defined Exception

UNIT – V 6 Hours

PL/SQL Cursors & Triggers: Types of Cursor-Implicit and Explicit- Insert, Update, Delete & Select into-PL/SQL Cursor- Creation and use of Database Triggers-Creating Forms using Templates

Text Books:

1. Joan Casteel, Oracle9i Developer: PL/SQL Programming, Course Technology,1st Edition, 2003.

2. Ben Forta, Oracle PL/SQL Training Guide, BPB Publications, 2016

Semester	Course Code	Course Title	Hours
V	22UITVAC2	HARDWARE AND NETWORKING ESSENTIALS	30

Course Outcomes

After completion of the course the students will be able to

        CO1: Know the basic components of computer system

        CO2: Understand the PC architecture and assemble the PC

        CO3: Acquire the knowledge of storage devices

        CO4: Know the fundamentals of computer networks

        CO5: Understand the functions of network connectivity devices

UNIT I   **6 Hours**

Basic computer system – Main system unit – Peripherals – Keyboard – keyboard types – keyboard organization – keyboard ergonomic – interfacing -Mouse- mouse types –mouse interface - Printer – printer types - Monitor – monitor types - Scanner – Digital camera - Laptop, PDA - Notebook computer

UNIT II   **6 Hours**

PC Architecture: The Case – Case types - The Power Supply - power supply types - Motherboard – motherboard chipset - motherboard types - Motherboard architecture – motherboard installation - Processor/CPU – Processor types – Latest processor types - processor installation- Adapter Cards - Display Devices - Ports and Cables – Assemble the PC – Disassemble the PC

UNIT III   **6 Hours**

Memory – Primary memory - RAM, ROM, ECC, DIP, SIPP, SIMM,DIMM, RIMM, DDR, XMS memory, Cache memory, shadow memory – POST – BIOS – Secondary memory – HDD – types of hard disk drives - tracks – sectors – installing and upgrading – partitioning - magnetic recording – CHKDSK- SCANDISK – FDISK – Optical disks – DVD – Blu-Ray

UNIT IV   **6 Hours**

Network: Introduction – Uses of Computer Networks – Network Hardware: Personal Area Networks –Local Area Networks – Metropolitan Area Networks – Wide Area Networks – Internetworks –Protocols - Reference Models: The OSI Reference Model –The TCP/IP Reference Model -IP address

UNIT V   **6 Hours**

Network Connectivity devices: Network Interface Card (NIC) – Types of NIC – Configuration of NIC - Repeaters – Hubs - Switches – Switch types - Bridges - Routers – Modems - types of Modems - Gateways – WIFI – Bluetooth – Access Point

Text Books:

    1. ManaharLotia& Others, Modern Computer Hardware Course, BPB, First Edition, 2004.

    2. N. Mathivanan, Microprocessors, PC Hardware and Interfacing, PHI, 2003.

    3. K.L. James, Computer Hardware, Installation, Interfacing, Troubleshooting and Maintenance, 2013