SRM Institute of Science and Technology

Department of Computer Applications

Delhi – Meerut Road, Sikri Kalan, Ghaziabad, Uttar Pradesh – 201204

Circular – 2020-21

MCA 1st semester

PROGRAMMING USING JAVA (PCA20C01J)

List of Programs

Lab1: Learning to work with Java IDE and Writing Simple Conversion Programs

Lab2: Operators

Lab 3: Arrays, Control Statements

Lab 4: Classes and Objects

Lab 5: Overloading Methods and Constructors, finalize() method

Lab 6: String Class, Command Line Arguments

Lab 7: Inheritance, Method Overriding, Abstract classes and methods

Lab 8: Packages and Interfaces

Lab 9: Exception Handling

Lab 10: Multithreading

Lab 11: Legacy Classes and Interfaces

Lab 12: Utility Classes

Lab 13: Event Handling

Lab 14: AWT Controls

Lab 15: Layout Managers, Byte and Character Streams

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MCA 1st semester

OPERATING SYSTEM (PCA20C02J)

List of Programs

Lab 1: Understanding the booting process of Linux

Lab 2: understand the behaviour of the OS and get the CPU type and model

Lab 4: Understanding various phases of compilation and System admin commands – Simple task automations

Lab 5: System admin commands – Basics

Lab 7: Shell Programs – Basic level

Lab 8: Process Creation and Overlay concept

Lab 9: File system and working with test programs

Lab 10: Programs using file system

Lab 11: Programs to implement shared memory

Lab 12: understand the paging operations

Lab 13: Program to implement file system interface

Lab 14: Understand the basic methods of free space

Lab 15: programs to implement the various CPU Scheduling Algorithms

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MCA 1st semester
DATABASE TECHNOLOGY (PCA20C03J)

List of Programs

Lab 1: Case study submission for ER Diagrams

Lab 2: SQL queries for students database

Lab 3: SQL queries for employee database

Lab 4: Execution of join operations

Lab 5: Practice of triggers-SQL Trigger | Student Database

Lab 6: Practice of triggers-SQL Trigger | Employee Database

Lab 7: Sample programs for cursors

Lab 8: Case study for JDBC

Lab 9: Creating a student database

Lab 10: Create an XML document for employee information

Lab 11: Simple program for joins

Lab 12: Study of normalization techniques

Lab 13: Case study submission for database administration

Lab 14: Case study submission SLO-2 for recovery

Lab 15: Case study submission for database backups

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MCA 1st semester

ADVANCED WEB APPLICATION DEVELOPMENT (PCA20D01J)

List of Programs

Lab 1: Sample application

Lab 2: Planning a real application

Lab 3: Development hardware

Lab 4: How to move data from view to the controller

Lab 5: Setting up the HTML framework with Jade templates and Bootstrap

Lab 6: Take the data out of the views and make them smarter

Lab 7: Pushing up the data

Lab 8: Making the application use the right database

Lab 9: Setting up the API in Express

Lab 10: Building the API request

Lab 11: Displaying and filtering the homepage list

Lab 12: Making HTTP requests from Angular to an API

Lab 13: Passing Data into Modal

Lab 14: More complex views and routing parameters

Lab 15: Adding and using a click handler

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MCA 1st semester
CYBER SECURITY(PCA20D02J)

List of Programs

Lab 1: Cyber security attacks case study Submission

Lab 2: Cyber security attacks case study Submission

Lab 3: TCP scanning using NMAP Port scanning using NMAP

Lab 4: TCP / UDP connectivity using Net cat

Lab 5: TCP / UDP connectivity using Net cat

Lab 6: Perform an experiment to demonstrate sniffing of router traffic by using the tool Wireshark

Lab 7: Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures (GnuPG)

Lab 8: Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures (GnuPG)

Lab 9: Perform an experiment to sniff traffic using ARP Poisoning

Lab 10: Perform an experiment how to use DumpSec

Lab 11: Perform an experiment how to use DumpSec

Lab 12: Implementing the Secure Sockets Layer (SSL v2/v3) and Transport Layer Security(TLS v1) network protocols

Lab 13: Setup a honey pot on network.

Lab 14: Monitor the honey pot on network

Lab 15: Demonstrate intrusion detection system (ids) using any tool (snort or any other s/w)

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MCA 1st semester
SOFTWARE ENGINEERING (PCA20D03J)

List of Programs

Lab 1: Identifying Project Objective and Scope

Lab2: Selection of Suitable software process Model of the suggested system

Lab3: Problem Statement Preparation

Lab 4: Project Planning

Lab 5: Performing Various Requirement Analysis

Lab 6: Develop Software Requirement Specification Sheet (SRS)

Lab 7: Draw Function Oriented Diagram

Lab 8: User's View Analysis

Lab 9: Structure view diagram

Lab 10: Test Case design for unit testing

Lab 11: Test Case design for Integration testing

Lab 12: Performing Testing and Debugging for a sample code

Lab 13: Preparation of Timeline charts and Tracking the Scheduling

Lab 14: Estimation of Effort and Risk Identification

Lab 15: Software Quality Assurance Components.

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MCA 1st semester
IT INFRASTRUCTURE MANAGEMENT (PCA20S01L)

List of Programs

Lab 1: Case Study and Hands-on training.

Lab 2: Case Study and Hands-on training.

Lab 3: Case Study and Hands-on training.

Lab 4: Case Study and Hands-on training.

Lab 5: Case Study and Hands-on training.

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Circular – 2020-21

MCA 3rd semester
OBJECT ORIENTED ANALYSIS AND DESIGN (PCA20C07J)

List of Programs

Lab 1: Case study – the Next Gen POS system

Lab 2: Identify a software system that needs to be developed

Lab 3: Document the Software Requirements Specification (SRS) for the identified system.

Lab 4: Identify use cases

Lab 5: Develop the Use Case model

Lab 6: Identify the conceptual classes and develop a Domain Model and also derive a Class Diagram from that.

Lab7: Using the identified scenarios, find the interaction between objects and represent them using UML

Lab 8: Sequence and Collaboration Diagrams.

Lab 9: Draw relevant State Chart and Activity Diagrams for the same system

Lab 10: Implement the system as per the detailed design.

Lab 11: package diagrams - Component and Deployment Diagrams.

Lab 12: Test the software system for all the scenarios identified as per the use case diagram

Lab 13: Improve the reusability and maintainability of the software system

Lab 14 By applying appropriate design patterns.

Lab 15: Implement the modified system and test it for various scenarios.
SUGGESTED DOMAINS FOR MINI-PROJECT: 1. Passport automation system. 2. Book bank 3. Exam registration 4. Stock maintenance system. 5.Online course reservation system

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MCA 3rd semester

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (PCA20D07J)

List of Programs

Lab: 1 Simple AI Techniques implementation

Lab 2 : Implementation of TicTac-Toe Game and Travelling Sales man problem

Lab 3 : Implementation of intelligent agents

Lab: 4 Knowledge implementation

Lab : 5 Implementations of FOPL and Rules

Lab : 6 Implementation of Ontology and FOL

Lab: 7 Concept Learning task

Lab : 8 Design a Learning System

Lab : 9 Implementation of candidate elimination algorithm

Lab: 10 Decision tree implementation

Lab : 11 Implementation of Decision tree and K- Mean algorithm

Lab : 12 Implementation of ID3 algorithm

Lab: 13 Neural Network model implementation

Lab : 14 Implementation of Multi-layer neural network

Lab : 15 Applying Backpropagation and genetic algorithm

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MCA 3rd semester
CLOUD COMPUTING (PCA20D08J)

List of Programs

Lab 1: Practical - Implement RPC and Bankers algorithm.

Lab 2: Create and distribute a Torrent file to share a file in LAN Environment

Lab 3: Demonstration and assessment of the implemented algorithms.

Lab 4: Use Google collaboration tools: create Google Docs, Sheets and Slides and share it with other users.

Lab 5: Explore public cloud services like Amazon, Google, Sales Force, Digital Ocean etc

Lab 6: Quizzes on different service models and deployment models. Report submission - Comparison of various services provided by different Cloud Service Providers (configuration of VM, cost, network bandwidth etc.).

Lab 7: Create a simple web service using Python Flask/Java/any language [Web Service: Client-server model should be implemented using socket/http].

Lab 8:Install Oracle Virtual Box/VMware Workstation and create a chat application [Note: Launch two virtual machines for chat application].

Lab 9: Review web services implementation - Proper Connection should be established between the client and server to make use of the service offered by the Server. Review the working of application in virtual environment.

Lab 10: Use security tools like ACUNETIX, ETTERCAP to scan web applications on the cloud.

Lab 11: Cloud networks for finding vulnerabilities, verifying leakage of information to an unauthorized third party.

Lab12: Report submission - Generate a detailed report describing vulnerabilities along with the suitable action that can be taken to remedy the loopholes.

Lab13: Install and configure OpenStack all-in-one using Devstack/Packstack.

Lab 14: Launch VMs in OpenStack through dashboard.

Lab 15: OpenStack Dashboard should be accessed though web browser. Verify the working of instance by logging into it/pinging the instance.

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MCA 3rd semester

INTERNET OF THINGS (IoT) (PCA20D09J)

List of Programs

Lab 1: Define and Explain Eclipse IoT Project.

Lab 2: List and summarize few Eclipse IoT Projects.

Lab 3:Smart Lighting

Lab 4: Sketch the architecture of IoT

Lab 5: Demonstrate a smart object API gateway service reference implementation in IoT toolkit

Lab 6: Write and explain working of an HTTP- to-CoAP semantic mapping proxy in IoT toolkit.

Lab 7: Describe gateway as a service deployment in Iot toolkit .

Lab 8: Explain application framework and embedded software agents for IoT toolkit

Lab 9: Explain working of Raspberry Pi.

Lab 10: Connect Rasberry Pi with your existing system components

Lab 11: Give overview of Zetta.

Lab 12: Home Automation – Level 0

Lab 13: Home Automation – Level 4

Lab 14: Smart Irrigation System

Lab 15: Weather Reporting Systems

Lab 16: Air Pollution Monitoring System

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MCA 2nd semester

PYTHON PROGRAMMING (PCA20C04J)

List of Programs

Lab 1:Python Numbers, List

Lab 2: Tuple, Strings, Set

Lab 3: Lambda & Filter in Python Examples

Lab 4: Creating Class in Python

Lab 5: Creating Object in Python

Lab 6: Creating Methods in Python

Lab7: process standard streams.

Lab 8 :Command-line arguments, shell variables

Lab 9: Python scripts here perform real tasks.

Lab10: Client Socket Methods

Lab 11: General Socket Methods

Lab 12:Creating Thread Using Threading Module

Lab 13: Represent compound data using Python

Lab 14: Lists, tuples, dictionaries

Lab 15: Read and write data from/to files in Python Programs

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MCA 2nd semester

COMPUTER NETWORKS (PCA20C05J)

List of Programs

Lab1: Familiarization with configuring and installing a LAN using packet tracer

Lab2: Experimenting with network protocols for achieving communication between computers using packet tracer

Lab 3:Creating a LAN using packet tracer

Lab4: To study different types of transmission media

Lab 5: Interconnection software for communication between two different network architectures using packet tracer

Lab 6: Using packet tracer to connect a network with different types of media connection

Lab7: Error Detecting Code Using CRC-CCITT (16-bit)-Java /C/C++ Program

Lab 8: Case study submission for: Sliding-Window Flow Control & Stop-And-Wait Flow Control

Lab 9: SIMULATION OF STOP AND WAIT PROTOCOL using NS/2 or any other tool

Lab10: Study of switches, bridges using Cisco packet tracer

Lab 11: To configure network security using two routers by blocking ICMP ping request - CISCO packet tracer

Lab 12: Case study submission for routing

Lab 13: Designing various topologies using cisco packet trace

Lab 14 :To configure Internet Access/Implementation using CISCO packet tracer

Lab15 :Web programming using HTML

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MCA 2nd semester

ANDROID APPLICATIONS DEVELOPMENT (PCA20D04J)

List of Programs

Lab1: Login page creation with Toast message

Lab 2: Student registration form with Toast message

Lab3: Implement Explicit Intent

Lab 4: Implement implicit Intent

Lab 5: Implement Time Picker

Lab 6: Implement Date Picker

Lab 7: Student Registration form using List view

Lab 8: Implement Context menu

Lab 9: Implement Option Menu

Lab 10: Shared preferences

Lab 11: SQLite database

Lab 12: SQLite database

Lab 13: Simulate paintbrush applications

Lab 14: Draw an object

Lab 15: Implement Web view

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MCA 2nd semester
PROGRAMMING USING C# (PCA20D05J)

Lab 1: Initialization and Declaration, Data types

Lab 2: Control Statements

Lab 3: Arrays

Lab 4: Classes, Constructors

Lab 5: Inheritance

Lab 6: Interface, Operator Overloading

Lab 7: Delegates

Lab 8: Exception Handling

Lab 9: Custom Exception, Thread

Lab 10: Create Windows Applications

Lab 11: Develop Web Applications using Validation and Navigation Controls

Lab 12: Develop Web Applications using Data Controls

Lab 13: Develop Web Applications Using Object Model

Lab 14: Develop Web Application Using Data Source Control

Lab 15: Develop Web Application Using Form View and Repeater Control

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MCA 2nd semester

SOFTWARE TESTING (PCA20D06J)

Lab 1: Test Case Design for Arithmetic Calculations

Lab 2: Test Case Report for Sorting of n number.

Lab 3: Preparation of Test Case Report on Triangle Program

Lab 4: Preparation of Test Case Report on Binary Search Program

Lab 5: Develop a Login Form and Prepare Test Case Report

Lab 6: Develop a Student Mark sheet application and Conducting Testing

Lab 7: Develop a Employee salary Processing application and Prepare Test Case Report

Lab 8: Develop a Flight Reservation application and Prepare Test Case Report

Lab 9: Web site Testing

Lab 10: Software Test Automation using testing tool

Lab 11: Writing and Tracking Test Cases

Lab 12: Bug Tracking System

Lab 13: Basic Operation of Selenium Testing tool

Lab 14: Working with Selenium Components

Lab 15:Selenium Web driver Handling

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MCA 2nd semester

DATA ANALYSIS USING R (PCA20S02J)

Lab 1: Implementation of how to install R program and import packages

Lab 2: Implementation of R program – basic

Lab 3: Implementation of R program – basic

Lab 4: Implementation of data types in R

Lab 5: Implementation of Control Statements in R and KNN in R

Lab 6: Implementation of Looping Statements

Lab 7: Implementation of Decision Tree

Lab 8: Implementation of Naïve Bayes

Lab 9: Implementation of Random Forest in R

Lab 10: Implementation of K means

Lab 11: Implementation of medoids

Lab 12: Implementation of Hierarchical with R

Lab 13: Implementation of data visualization in R

Lab 14: Implementation of various charts

Lab 15: Implementation of predictive model in R