



**PUNE INSTITUTE OF COMPUTER TECHNOLOGY
DHANKAWADI, PUNE –43
DEPARTMENT OF COMPUTER ENGINEERING**

410247:Laboratory Practice IV

Teaching Scheme :Practical: 02 Hours/Week

Credit :01

Examination Scheme :Term Work: 50 Marks

Companion Course: Ele. III(410244), Ele.IV(410245)

Course Objectives:

- Learn android application development related to pervasive computing
- Understand various multimedia file formats
- Understand various vulnerabilities and use of various tools for assessment of vulnerabilities
- Understand information retrieval process using standard tools available
- Learn GPU programming and implementation of same using open source libraries
- Learn installation and use of open source software testing tools

Course Outcomes:

After completion of the course, students will be able to

CO1: Apply android application development for solving real life problems

CO2: Design and develop system using various multimedia components.

CO3: Identify various vulnerabilities and demonstrate using various tools.

CO4: Apply information retrieval tools for natural language processing

CO5: Develop an application using open source GPU programming languages

CO6: Apply software testing tools to perform automated testing

List of Laboratory Experiments

Class: B.E.

Semester: I

Subject: Laboratory Practice IV (410247)

EXP. NO.	PROBLEM STATEMENT (Any 05 assignments per course AND 01 Mini- project per course)
410244(A): Pervasive Computing	
Any 5 assignments from group 1 and 1 Mini project from group 2 is mandatory.	
Group 1	
1.	Develop an indoor location system to Library guide system where it can direct a user to the bookshelf from a mobile device.
2.	Design a pervasive application in which remote computer monitors our health statistics & will determine when one is in trouble & will take appropriate action for rescue.
3.	Develop an Android application in which car will use the Internet to find nearby open parking space.
4.	Android User Activity Recognition – Still, Walking, Running, Driving etc.
5.	Design and build a sensing system using micro-controllers like - Arduino / Raspberry Pi / Intel Galileo to sense the environment around them and act accordingly.
6.	Smart Mobile Application with orientation sensing for users to put the phone in meeting / silent mode- OR- outdoor/ loud mode based on the orientation of the device.
Group 2	
7.	PMini project: Develop Food Ordering System which uses the GPS of an Android-based Smartphone to record and analyze various locations that could give alert to the user, then asking the user to select particular food from given hotel list and place an order.
8.	Mini Project: Design a mobile sensing platform mounted on a glove that integrates several sensors, such as touch pressure, imaging, inertial measurements, localization and a Radio Frequency Identification (RFID) reader for fruit classification and grading system.
9.	Mini Project: Sensor-Based Assistive Devices for Visually Impaired People. It should cover following points: <ul style="list-style-type: none"> • Determining obstacles around the user body from the ground to the head; • Affording some instructions to the user about the movement surface consists of gaps or textures; • Finding items surrounding the obstacles; Providing information about the distance between the user and the obstacle with essential direction instructions.
10.	Mini Project: Develop a Real time application like a smart home with following requirements: If anyone comes at door the camera module automatically captures his image send it to the email account of user or send notification to the user. Door will open only after user's approval.

Based on 410244(B): Multimedia Techniques	
Group 1	
Any 5 assignments from group 1 and 1 Mini project from group 2 is mandatory.	
1	To study and install open-source multimedia tools and create an application using appropriate tool to design the college webpage
2	To create JPEG Image that demonstrates various features of an Image editing tool.
3	Create or play a sample MIDI format sound file using LMMS / MuseScore / Tuxguitar software tool. Edit the sample file by applying effects like bend, slide, vibrato, and hammer-on/pull-off. Export / Convert final MIDI to WAV file format.
4	Implement transform coding, quantization, and hierarchical coding for the encoder and decoder of three-level Hierarchical JPEG.
5	Create an immersive environment (living room/ battlefield/ tennis court) with only static game objects. 3D game objects can be created using Blender or use available 3D models.
6	Create a web page for a clothing company which contains all the details of that company and at least five links to other web pages.
Group2	
7.	Mini Project: Design and develop a Navigation Assistance System.
8.	Mini Project: Design and Develop a Traffic Monitoring System.
9.	Mini Project: Design and develop a Tool for converting image format (e.g. bmp to jpeg)
10.	Mini Project: Design and develop a Tool for converting audio format (e.g. wav to mp3)
Based on 410244(C): Cyber Security and Digital Forensics	
Group 1	
1	Write a program for Tracking Emails and Investigating Email Crimes. i.e. Write a program to analyse e-mail header
2	Implement a program to generate and verify CAPTCHA image
3	A person on a nearby road is trying to enter a WiFi network by trying to crack the Password to use the IP Printer resource; write a program detect such attempt and prohibit the access. Develop the necessary scenario by Using an IEEE 802.11, configure a Wi-Fi adapter and Access Point
4	Write a computer forensic application program for Recovering permanent Deleted Files and Deleted Partitions
5	Write a program for Log Capturing and Event Correlation
6	Configure and demonstrate use of vulnerability assessment tool like Wireshark or SNORT
7	Study of Honeypot
Group 2	
8.	Mini-project- Design and develop a tool for digital forensic of images

9.	Mini Project - Design and develop a tool for digital forensic of audio
10.	Mini Project -: Design and develop a tool for digital forensic of video
11.	Mini Project - Design a system for the analysis of cyber-crime using various cyber forensic techniques and compare each technique with respect to integrity, confidentiality, availability
Based on 410244(D): Object Oriented Modeling And Design	
Group 1	
1	Draw state model for telephone line, with various activities.
2	Draw basic class diagrams to identify and describe key concepts like classes, types in your system and their relationships.
3	Draw one or more Use Case diagrams for capturing and representing requirements of the system. Use case diagrams must include template showing description and steps of the Use Case for various scenarios.
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5	Draw activity diagrams to display either business flows or like flow charts.
6	Draw component diagrams assuming that you will build your system reusing existing components along with a few new ones
7	Draw deployment diagrams to model the runtime architecture of your system.
Group 2	
8.	Mini Project: Draw all UML diagrams for your project work.
9.	Mini Project - Develop a Block chain based application for health related medical records Draw following UML Diagrams for Bank Management application <ul style="list-style-type: none"> a. Class Diagram b. Object Diagram c. ER Diagram Component Diagram
Based on 410245(A): Information Retrieval	
Group 1	
1	Write a program to Compute Similarity between two text documents.
2	Implement Page Rank Algorithm.
3	Write a program for Pre-processing of a Text Document: stop word removal.
4	Write a map-reduce program to count the number of occurrences of each alphabetic character in the given dataset. The count for each letter should be case-insensitive (i.e., include both upper-case and lower-case versions of the letter; Ignore non-alphabetic characters).
5	Write a program to implement simple web crawler.
6	Write a program to parse XML text, generate Web graph and compute topic specific page
Group 2	
7.	Mini project: Develop Document summarization system

8.	Mini Project: Develop Tweet sentiment analysis system
9.	Mini Project: Develop Fake news detection system
10	Mini Project: Develop a Abstractive summarization system
Based on 410245(C): Mobile Computing	
Group 1	
1	To implement a basic function of Code Division Multiple Access (CDMA) to test the orthogonally and autocorrelation of a code to be used for CDMA operation. Write an application based on the above concept.
2	Implementation of GSM security algorithms (A3/A5/A8)
3	Write an application that draws basic graphical primitives on the screen.
4	Develop a native application that uses GPS location information.
5	Design an android Application for Frame Animation
6	Create a simulation to show working of 3G Mobile network
7	Create a simulation to show working of 4G Mobile network
Group 2	
8.	Mini Project: Create an application for Bank using spinner, intent i) Form 1: Create a new account for customer ii) Form 2: Deposit money in customer account. iii) Link both forms, after completing of first form the user should be directed to second form iv) Provide different menu options
9.	Mini Project: Create the module for collecting cellular mobile network performance parameters using telephony API Manager i) Nearest Base Station ii) Signal Strengths iii) SIM Module Details Mobility Management Information
10	Mini Project: Create the module for payment of fees for College by demonstrating the following methods. i) FeesMethod()- for calculation of fees ii) Use customized Toast for successful payment of fees iii) Implement an alarm in case someone misses out on the fee submission deadline Demonstrate the online payment gateway
11	Mini Project: Create an app to add of a product to SQLite database and make sure to add following features i) SMS messaging and email provision ii) Bluetooth options iii) Accessing Web services iv) Asynchronous remote method call v) Use Alert box for user notification

Based on 410245(D): Software Testing and Quality Assurance	
Group 1	
1	Write TEST Scenario for Gmail Login Page
2	Test Scenario for Gmail Login Page
3	Write Test cases in excel sheet for Social Media application or website
4	Create Defect Report for Any application or web application
5	Installation of Selenium grid and selenium Web driver java eclipse (automation tools).
6	Prepare Software requirement specification for any project or problem statement
Group 2	
7.	Mini Project: Software Testing and Quality Assurance Mini Project Dynamic website of covid-19 information using HTML, CSS, JAVASCRIPT and PHP, MySQL database used to store user account, comment, and registration form details. Regular Expression test cases for testing purpose
8.	Mini Project: Create a small application by selecting relevant system environment / platform and programming languages. Narrate concise Test Plan consisting features to be tested and bug taxonomy. Prepare Test Cases inclusive of Test Procedures for identified Test Scenarios Perform selective Black-box and White-box testing covering Unit and Integration test by using suitable Testing tools. Prepare Test Reports based on Test Pass/Fail Criteria and judge the acceptance of application developed
9.	Mini Project: Create a small web-based application by selecting relevant system environment / platform and programming languages. Narrate concise Test Plan consisting features to be tested and bug taxonomy. Narrate scripts in order to perform regression tests. Identify the bugs using Selenium WebDriver and IDE and generate test reports encompassing exploratory testing.

Subject Coordinator

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