**CITC - IT Department**

Computer Laboratory Activity Form

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| Course Code | | IT323 | |
| Course Title | | Application Development and Emerging Technology | |
| Topics Covered | | Overview of Software and Hardware Technology | |
| Objectives | | The objective of this comprehensive laboratory activity is to provide students of IT323 with an in-depth understanding of cross-platform application development by integrating mobile, web, and emerging technologies. Students will gain practical experience in building a feature-rich application that leverages the capabilities of both mobile and web platforms, while also exploring cutting-edge technologies for enhanced functionality and user experience. | |
| Materials:   1. Computers with internet access 2. Development environments for web and mobile platforms (e.g., Visual Studio Code, Android Studio, Xcode) 3. Text editor or Integrated Development Environment (IDE) 4. Mobile devices (smartphones or emulators) 5. Internet connectivity 6. Optional: Virtual Reality (VR) headsets, Augmented Reality (AR) devices, Machine Learning frameworks   Duration: 4-6 hours (can be divided into multiple sessions) | | | |
| **Description**  **Title :** Comprehensive Cross-Platform Application Development Laboratory: Exploring Mobile, Web, and Emerging Technologies  **Activity Steps:**   1. Introduction to Cross-Platform Development and Emerging Technologies:  * Provide an overview of cross-platform development, emphasizing its importance and benefits in modern software development. * Introduce various emerging technologies such as Virtual Reality (VR), Augmented Reality (AR), Internet of Things (IoT), and Machine Learning (ML), highlighting their potential applications in mobile and web development.  1. Setting Up Development Environments:  * setting up the development environments for web and mobile platforms, ensuring that necessary software and tools are installed.  1. Ideation and Project Planning:  * Present a project scenario or use case (e.g., a location-based social networking app). * Defining project requirements, and creating a development plan.  1. Designing the User Interface:  * Design the user interface for both the mobile and web versions of the application, considering factors such as usability, accessibility, and responsiveness. * Incorporate modern design principles and user experience (UX) best practices.  1. Implementing the Web Interface:  * Building the web interface of the application using HTML, CSS, and JavaScript. * Emphasize the importance of responsive design and cross-browser compatibility.  1. Developing the Mobile Application:  * Creating a mobile application framework using a cross-platform development framework such as React Native or Flutter. * Implement core functionalities such as user authentication, geolocation services, and real-time communication.  1. Integrating Mobile and Web Components:  * Demonstrate how to establish seamless communication and data synchronization between the mobile app and the web interface. * Implementing the features that allow users to seamlessly switch between the mobile and web versions of the application.  1. Creating UML Diagrams:  * Introduce Unified Modeling Language (UML) diagrams for modeling the system's structure and behavior. * Create UML diagrams such as Class Diagrams, Sequence Diagrams, and Activity Diagrams to document the application architecture and interactions.  1. Integrating Mobile, Web, and Emerging Technologies:  * Demonstrate how to integrate mobile and web components of the application, ensuring seamless data synchronization and user experience. * Incorporating the emerging technologies into the application, based on the project requirements.  1. Testing, Debugging, and Optimization:  * Test the application on various devices and browsers. * Demonstrate techniques for debugging and optimizing performance issues.  1. Deployment and Distribution:  * Deploy the cross-platform application to web hosting services and mobile app stores. * Discuss strategies for promoting and distributing the application to target users.  1. Presentation and Documentation:  * Present the projects, demonstrate the functionality and features of their cross-platform applications. * Compile the DFD and UML diagrams along with project documentation, explaining the system architecture and design decisions.  1. Reflection and Discussion:  * A reflective discussion with the experiences, challenges, and lessons learned during the laboratory activity. * Discuss the role of DFD, UML diagrams, and emerging technologies in software development.   **Assessment:**  Assessment of student performance can be based on:   * Completeness and functionality of the cross-platform application. * Clarity and accuracy of the DFD and UML diagrams. * Creativity and usability of the user interface design. * Integration and utilization of emerging technologies to enhance application functionality. * Presentation skills and ability to articulate design decisions and project insights. | | | |
| Activity No : | # 2 | | |
| Activity Name : | Comprehensive Cross-Platform Application Development Laboratory: Exploring Mobile, Web, and Emerging Technologies with DFD and UML Documentation | | |
| Student ID : |  | | |
| Student Name : |  | | |
| Course & Year | BSIT – 3th Year | | Section : |