Chapter 2

Hardware and Software Requirements

2.1 Hardware Requirements:

Processor:

- Minimum: Intel i3 / AMD Ryzen 3
- Recommended: Intel i5 or above / AMD Ryzen 5+

RAM:

- Minimum: 4 GB
- Recommended: 8 GB or more (for smooth performance with emulators and IDEs)

Storage:

- Minimum: 10 GB free space
- Recommended: SSD with at least 20 GB free space for faster build times

Display:

- Minimum: 13” screen with 1024×768 resolution
- Recommended: 15.6” Full HD or larger for better development experience

Graphics:

- Minimum: Integrated graphics (sufficient for Flutter development)
- Recommended: Dedicated GPU (for smoother Android Emulator usage)

Internet Connectivity:

- Required for Firebase services, app updates, and package downloads
- Stable broadband recommended for real-time testing and debugging

2.2 Software Requirements

Frontend Framework:

- Flutter (for cross-platform app development using a single codebase

Programming Language:

- Dart (used in Flutter for building UI and app logic)

Backend Services:

- Firebase (for Authentication, Firestore Database, Cloud Storage, and Notifications)

Development Tools:

- Android Studio or Visual Studio Code (for writing, testing, and debugging code)

Operating System (Development Environment):

- Windows 10/11, macOS, or Linux (Ubuntu recommended for stability

Version Control System:

- Git and GitHub (for project version management and team collaboration)

Chapter 5

Conclusion and Future Work

Conclusion

- The E-Learning App provides an effective platform for students to learn anytime, anywhere.
- It enables instructors to manage courses, content, and student activities with ease.
- The use of Flutter ensures cross-platform support, saving time and resources.
- Firebase integration offers secure login, cloud storage, and real-time data sync.
- The system promotes self-paced learning and enhances student engagement.

Future Work

- Integrate live class features using video conferencing tools.
- Add certificate generation for completed courses.
- Enable offline access to downloaded videos and notes.
- Include a payment gateway for premium course subscriptions.
- Develop AI-based personalized course recommendations.