INTRODUCTION TO C++ PROGRAMMING – MID SEMESTER

CAPSTONE PROJECT

Digital Attendance System for Hour-Based Lectures

Programme: HND Electrical Engineering (Level 200)

Course Code: EEE227

Assessment Type: Project-Based Midterm Assignment

Weighting: 30 percent

Duration: Four Weeks

Code Submission Deadline: February 23, 2026

Project Demonstration Date: February 24, 2026

Development Environment: VS Code

Version Control: GitHub

Platform: Windows, Offline First

1. Background and Problem Scenario

Attendance taking in many lecture halls is still paper-based. This practice leads to lecture disruptions, delays between consecutive lectures, misplaced records, and difficulty generating reliable attendance summaries. This assignment requires students to design and implement a digital attendance system using C++ to address this challenge.

2. Assignment Type and Rules

- This is an individual assignment or a team of two students maximum
- All submitted work must be original
- GitHub must be used for version control and submission
- The repository must show steady progress over four weeks
- Late submissions attract penalties in line with departmental policy

3. Learning Objectives

- Apply C++ programming concepts to a real engineering-related problem
- Demonstrate effective use of variables, arrays, functions, and classes
- Design a menu-driven console application
- Implement file handling for persistent storage
- Demonstrate professional software development practices using GitHub

4. Technical Requirements

- Programming Language: C++
- User Interface: Console-based
- Data Storage: Text files using fstream
- Platform: Windows (offline operation required)

5. Functional Requirements

5.1 Student Management

1. Register students
2. View all registered students
3. Search students by index number

5.2 Attendance Session Management

1. Create a lecture session (course code, date, start time, duration)
2. Mark attendance as Present, Absent, or Late
3. Update attendance records where necessary

5.3 Reports and Summary

- Display attendance list for a session
- Display summary counts of attendance status

5.4 File Storage

- Save student records to file
- Save and load attendance sessions
- Data must persist between program executions

6. Weekly Timeline and Milestones

Week 1

- Create GitHub repository and initial project structure
- Implement Student class

- Add and view students
- Minimum of 3 meaningful commits

Week 2

- Implement *AttendanceSession* class
- Create lecture sessions
- Build menu-driven program flow
- Minimum of 3 meaningful commits

Week 3

- Implement attendance marking logic
- Generate reports and summaries
- Improve input validation
- Minimum of 3 meaningful commits

Week 4

- Implement file saving and loading
- Refactor code and improve readability
- Complete README documentation
- Final testing and submission
- Minimum of 3 meaningful commits

7. Sample Repository Structure

digital-attendance-system/

├── main.cpp

├── README.md

├── students.txt

├── session_EE201_YYYY_MM_DD.txt

8. Marking Scheme (30 Marks)

Student management: 6 marks

Session creation: 6 marks

Attendance marking: 6 marks

File storage and loading: 6 marks

Reports and summary: 4 marks

Code quality and structure: 2 marks