**COE/ELE 70B : Group and Individual Milestones & Deliverables**

**Group Members**:

Student A: Taskin Abdur-Rahman

Student B: Yadu Krishnan Madhu

Student C: Zohraan Badar

Student D: Kisoban Rajendran

**Project Title:** AA05 - Automated Parking Management System

**Note: Please refer to the GANTT chart posted on D2L for all Due Dates.**

**Phase: I**

**Project Manager:** Yadu Krishnan Madhu

\* “Initials” under “individual tasks” means you put your initials (first letter of your firstname . first letter of your lastname), the assignment of tasks **should match** your COE/ELE70A.

\* Note: The below milestones template is subjected to modifications by your respective FLCs.

| **Week** | **Group Tasks** | **Individual Tasks: Student A:** T.A | **Individual Tasks: Student B:**  Y.M | **Individual Tasks: Student C:**  Z.B | **Individual Tasks: Student D:**  K.R |
| --- | --- | --- | --- | --- | --- |
| **W1** | **Phase I Milestones and Deliverables Submission by Project Manager** | * Complete all frontend authentication functionalities * Complete BOM and order parts. | * Investigate the “Firebase Arduino Client Library for ESP8266, ESP32” Library * Set up the repository, write code to establish a Firebase database connection, and upload data from ESP32. | * Investigate potential parts/physical components required for the project. * Discuss the compiled purchase list with the team and form decisions. | * Collect the dimensions of the prototype fixture. * Update the current prototype model with the acquired real-world dimensions |
| **W3** | **Milestone Compliance Report - 1 (MCR-1) submission and deliverables demo. Selection of Project Manager for Phase II (PM2).** | * Completed frontend authentication functions:   + Login, Logout, Signup, Password Reset * Completed Bill of Materials * Completed design circuit for phase 1 components * Gathered parts needed to test esp32 functionalities | * Connected the ESP32 with Firebase API. Established connection to enable read/write operations to the Firebase ``realtime” database. * Hooked up a simple LED circuit to the ESP32 to display realtime communication between Firebase and the led circuit. * Set up the ESPCAM web server that functions as an image capture. * Wrote a python script that captures images and checks for QR codes embedded within images. Script also decodes the QR code if present. | * Completed importing front-end code base into the codesandbox. * Completed setting up the Firebase emulator. | * Gathered most of the parts required for the circuit * Created a simple circuit based off the schematic |
| **Phase I**  **Deliverables** |  | * Show frontend authentication functionalities.   + Login, Signup, Logout | * Display communication between ESP32 and Firebase. * Display QR code scanning to be working.. | * Show case frontend design pages. | * Showcase the LED circuit board and its function. |
| **For FLC (Internal Use ONLY)**  **Milestones Compliance Report 1 (Project Manager: ) Submission Date (Due: Friday by 2 pm of week 3):**  **Minutes of Meetings weeks 1, 2, and 3 (Project Manager: ) Submission Date (Due: Friday by 2 pm of respective weeks):**  **Notes:** | | | | | |
| **Phase: II**  **Project Manager:** Taskin Abdur-Rahman | | | | | |
| **W4** | **Phase II Milestones Submission by PM2** | * Finish the parking reservation feature. * Gather some test data to start building data visualization features. * Connect esp32 to led and sensor circuit and build test with server communication. | * Investigate Image detection capabilities of ESPCAM and research frameworks/libraries required for Image detection. * Investigate the process of storing images in Firebase from ESPCAM. | * Tag team with Student A to assist with primary tasks including front-end development * Research Arduino APIs required to control and access components such as LEDs, inverters, weight sensors etc… | * Tag team with Student B to assist by researching ESPCAM capabilities. * Connect(if parts are available)/Design components together with breadboards (temporary housing). |
| **W5** | **Theory and design sections of report submission** | * Make any corrections to hardware components and make final validations. * Build the data visualization pages and backend functions. * Perform end user testing. | * Gain a fundamental understanding of the processes and techniques behind image and motion detection. * Research Datasets or libraries/frameworks required for detecting vehicles. | * Assist Student A with circuit simulation in Tinkercad. * Work with student D on circuit design and connection. | * Research component limitations (power rating etc). * Adjust circuitry to optimize for power efficiency. Discuss/suggest necessary or recommended changes based on circuit performance. |
| **W6** | **Milestone Compliance Report - 2 (MCR-2) submission and deliverables demo. Selection of Project Manager for Phase III (PM3)** | * Build a mock setup for full validation of use cases and perform full validation for 1 parking spot. * Use this entire phase to fully validate the use case for 1 parking spot. * Develop build plan for 7 more parking spots. * Develop build plan for housing/enclosure of all electronics. | * Initiate application development to detect vehicles and compute parking spot states. * Initiate Firebase database integration with the main application. | * Assist in connecting circuits with student D. * Discuss with Student B and fix failures occurring with backend applications. * Discuss with Student A and fix failures occurring with front-end applications. * Design test cases to iron out errors and faults in the code. | * Refine and update circuitry as components become available. * Work with Student A to decide on a circuit model that works with ESP32 and ESPCAM. |
| **Phase II**  **Deliverables** |  | * Demonstrate functionality of user flow on physical mock setup. | * Display Image detection capabilities of the ESPCAM. * Showcase state change and real-time database updates as part of the application. * Discuss necessary changes or updates with the Group and FLC regarding the circuit and application. | * Display tinker cad simulation if physical parts are not available alongside Student D. * Discuss necessary changes or updates with the Group and FLC regarding the circuit and application. | * Display the physical(if available)/simulation circuit model and its capabilities. * Discuss necessary changes or updates with the Group and FLC regarding the circuit and application. |
| **For FLC (Internal Use ONLY)**  **Milestones Compliance Report 2 (Project Manager: ) Submission Date (Due: Friday by 2pm of week 6):**  **Minutes of Meetings weeks 4, 5, and 6 (Project Manager: ) Submission Date (Due: Friday by 2pm of respective weeks):**    **Notes:** | | | | | |
| **Phase: III**  **Project Manager:** Zohraan Badar | | | | | |
| **W7** | **Submission of Phase III milestones and deliverables by PM3 to the FLC** | * Develop ML backend functions for parking occupancy predictions and for revenue predictions. * Develop data visualization pages functionality on frontend. | * Revise and make changes to code based on feedback. * Make general optimizations. * Conduct more research as needed. | * Keep track of team progress. * Schedule meetings and notify the team of important updates. * Help Students B and A with optimizing code and fixing errors. | * Continue working on building out the physical circuit until all parts are available. * Look to make circuit optimizations. |
| **W9** | **Milestone Compliance Report - 3 (MCR-3) submission and deliverables demo. Selection of Project Manager for Phase IV (PM4).** | * Build parking spot hardware components (x8). * Install each parking spot component in the parking lot. * Perform end-to-end testing. * Fix issues and bugs. | * Assist Student A with frontend tasks * Assist Student B with implementing test cases. * Assist Student D with soldering components. | * Implement test cases and discuss potential fixes and solutions with the team if any errors and faults are found. | * Disassemble components that are in temporary housing such as components connected to breadboards * Solder components together as part of the final design. * Work with Students B and C to ensure components function as before. |
| **Phase III**  **Deliverables** |  | * Display complete/final model circuitry with functioning fetch calls that fetch system state changes. * Update FLC and discuss necessary changes with the team and FLC. | * Display the final working model of ESPCAM. The model should be capable of image detection and making Firebase update calls to update system states. * Update FLC and discuss necessary changes with the team and FLC. | * Display the final working model of ESPCAM. The model should be capable of image detection and making Firebase update calls to update system states. | * Display complete/final model circuitry with functioning fetch calls that fetch system state changes. * Update FLC and discuss necessary changes with the team and FLC. |
| **For FLC (Internal Use ONLY)**  **Milestones Compliance Report 3 (Project Manager: ) Submission Date (Due: Friday by 2pm of week 9):**  **Minutes of Meetings weeks 7, 8, and 9 (Project Manager: ) Submission Date (Due: Friday by 2pm of respective weeks):**    **Notes:** | | | | | |
| **Phase: IV**  **Project Manager:** Kisoban Rajendran | | | | | |
| **W10** | **Submission of Phase IV milestones and deliverables by PM4 to the FLC.** | * Fixing issues with hardware setup. * Continue with end-to-end testing and validate system. | * Make the last and final necessary changes discussed during the previous phase. | * Make the last and final necessary changes discussed during the previous phase. | * Keep track of team progress. * Schedule meetings and notify the team of important updates. * Make the last and final necessary changes discussed during the previous phase, |
| **W12** | **Milestone Compliance Report - 4 (MCR-4) submission and deliverables demo. Final project demo, and evaluation. Submission of Individual project contribution summary prior to oral exam. (Your FLC may choose to conduct oral exams in week W12 and/or week W13)** | * Perform end-to-end testing for backend and frontend use cases. * Fix bugs and validate | * Prepare for the oral exam. | * Prepare for the oral exam. | * Prepare for the oral exam. |
| **Phase IV**  **Deliverables**  **&**  **Final**  **Demo** |  | * Start working on the project report. * Start working on the project presentation. | * Start working on the project report. * Start working on the project presentation. | * Start working on the project report. * Start working on the project presentation. | * Start working on the project report. * Start working on the project presentation. |
| **For FLC (Internal Use ONLY)**  **Milestones Compliance Report 4 (Project Manager: ) Submission Date (Due: Friday by 2pm of week 12):**  **Minutes of Meetings weeks 10, 11, and 12 (Project Manager: ) Submission Date (Due: Friday by 2pm of respective weeks):**    **Notes:** | | | | | |
| **W13** | **Mandatory Tasks** (both as Group and Individual)**:**   * **Final Demo,** * **Project Oral Exam and** * **Final Report Submission.** | * Prepare for Demo. * Prepare for the Oral Exam. * Prepare for the open house demonstration. | * Prepare for Demo. * Prepare for the Oral Exam. * Prepare for the open house demonstration. | * Prepare for Demo. * Prepare for the Oral Exam. * Prepare for the open house demonstration. | * Prepare for Demo. * Prepare for the Oral Exam. * Prepare for the open house demonstration. |