Bangabandhu Sheikh Mujibur Rahman Digital University, Bangladesh

Dept. of IoT and Robotics Engineering (IRE)

IRE 212: IoT Architecure Lab

Lab Project Guideline

The primary objective of the IoT architecture lab is to enable students to apply IoT concepts in real-world scenarios. Students will design, implement, and demonstrate a fully functional IoT system tailored to a specific problem or scenario. The project will encompass the entire IoT architecture lifecycle, from sensor data acquisition to cloud integration, data processing, and user interaction.

Major Tasks, Timeline, and Assessment Criteria:

Sl no.	**Timeline**	**Major Task**	**Assessment Criteria**	**Marks**
1	Week 1-2	• Project Group Formation and Problem Selection • Understanding IoT Project Goals and Objectives • Clarification of Expectations, Deliverables, and Evaluation Criteria	• Submission of a brief project proposal outlining the chosen problem and initial design ideas. • Clear definition of project goals and objectives. • Group roles and responsibilities defined.	2
2	Week 3-4	• Conceptual Design (IoT Architecture). • Sensor and microcontroller selection. Initial IoT network and system design.	• Submission of the IoT architecture, sensor specifications, and network design.	3
3	Week 5-6	• Identify the necessary hardware components and sensors.	• Evaluation of the prototype with correct hardware integration, sensor data	3

		• Prototype development with sensor data acquisition and communication setup. • Develop basic functionality (e.g., data collection and wireless transmission).	collection, and wireless communication.	
4	Week 7	• Peer review sessions. • Mid-Project Presentation to demonstrate progress and gather feedback.	• Feedback from peer review sessions and quality of the mid-project presentation.	2
			Midterm Evaluation	12
5	Week 8-9	• Integration with cloud platform (e.g., AWS IoT, Azure, ThingSpeak**)** • Implement MQTT or HTTP protocol for data transmission • Develop data Storage solutions on the cloud	• Successful integration with the chosen cloud platform. • Correct implementation of MQTT/HTTP protocols. • Proper setup of data storage and retrieval mechanisms. • Documentation of data flow from device to cloud.	5
6	Week 10-11	• Develop the front-end application or dashboard for data visualization • Implement additional functionalities **(**e.g., Alerts, Control Mechanisms**)** • Regular testing and debugging of the System	• User-friendly and functional interface design. • Implementation of additional features enhancing project functionality. • Regular testing logs and debugging reports. • Integration between front-end and back-end systems.	6

7	Week 12	• Prepare detailed project documentation • Finalize all system components and ensure full functionality	• Comprehensive documentation covering all aspects of the project	3
8	Week 13	• Final presentation and demonstration of the project • Showcasing the working system and its functionalities**.**	• Quality and clarity of the final presentation. • Demonstration of the fully functional IoT system. • Ability to answer questions and explain system components effectively. • Overall professionalism and coherence of the presentation.	4
			Final Evaluation	18