Mold Growth Risk Predictor

AI-Driven IoT System Development

Project Plan Preparation (PPP)

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Course: CSC 494 – AI-Driven IoT System Development

1. Problem & Why It Matters

Problem

Mold growth in indoor spaces is often undetected until it causes:

- Health issues
- Property damage
- Costly remediation

Why This Is Important

- Mold growth depends on **environmental conditions over time**
- Most people do not continuously monitor humidity and temperature
- Early awareness can help **prevent** mold before damage occurs

2. Project Focus (Team / Topic)

Project Focus Area

Sensor + Software Application

- Sensors collect environmental data
- Software visualizes patterns and trends
- System supports user decision-making

This project focuses on **building applications on top of given hardware**.

3. System Overview

High-Level Concept

1. Temperature & humidity sensor collects data
2. ESP32 logs and transmits readings
3. Web application displays:
    - Trends over time
    - Periods of elevated humidity
4. User interprets patterns to assess mold risk

This is a **decision-support system** only.

4. Role of AI in This Project

AI will be used as a **development and learning assistant**, not as a predictive model.

AI will help with:

- Embedded programming
- Sensor integration and debugging
- Web application development
- Explaining unfamiliar concepts and tools

5. Learning with AI (Two Topics)

Hardware Topic (with AI)

- **I2C Communication**
  - Understanding how the AHT10 sensor communicates with the ESP32
  - Using AI to learn datasheets, wiring, and libraries

Software Topic (with AI)

- **Web Application Development**
  - Building a simple web dashboard
  - Visualizing temperature and humidity trends
  - Using AI to learn frameworks and visualization techniques

6. Sprint 1 – Learning & Exploration

What I Need to Learn (Iteration 1)

- How to interface the AHT10 sensor with the ESP32
- How to collect and log data reliably
- How to structure data for visualization

Activities

- Use AI to learn sensor libraries
- Prototype sensor readings
- Test basic data logging

7. Sprint 2 – Feature Development

What I Will Build (Iteration 2)

- Web application dashboard
- Time-based graphs for humidity and temperature
- Basic indicators for elevated humidity conditions

Activities

- Refine data presentation
- Analyze changes over time
- Evaluate system limitations

8. Project Scope

Included

- Environmental monitoring
- Data visualization
- User decision support

Not Included

- Mold detection or diagnosis
- Medical or health recommendations
- Advanced machine learning models

9. Final Goal

By the end of the semester, I expect to:

- Build a **working IoT prototype**
- Demonstrate it as part of my **portfolio**
- Use it as a foundation for future extensions

Conclusion

This project demonstrates how IoT sensing and AI-assisted development can help users understand environmental conditions that contribute to mold growth — **before damage occurs**.

Thank you!