Project 3: Open Innovation – Propose Your Own Blockchain Use Case

Overview

This open-ended project track allows students to **conceptualize, design, and prototype** a blockchain-based solution to a real-world problem of their choice. The emphasis is on **innovation, originality, and practical feasibility**. Students may explore emerging or interdisciplinary applications of blockchain beyond traditional domains such as finance and supply chain — for example, sustainability tracking, creative industries, education credentials, energy trading, or public sector governance.

The proposed idea must be approved by the instructor before development begins to ensure appropriate scope and technical depth.

Objectives

- Encourage creative thinking and problem-driven blockchain design.
- Demonstrate a deep understanding of blockchain components (smart contracts, consensus, tokenization, governance).
- Assess the feasibility and societal impact of the proposed solution.
- Integrate technical, ethical, and regulatory considerations in the system design.

Requirements

1. **Proposal:**
    - Submit a 1–2 page project proposal including:
        - Problem statement and motivation.
        - Why blockchain is an appropriate solution.
        - High-level system architecture.
        - Chosen platform (Ethereum, Hyperledger, Polygon, etc.).
    - Approval required from instructor before proceeding.
2. **System Design:**
    - Identify stakeholders, roles, and transaction types.
    - Define how trust, transparency, or decentralization are achieved.

    - Provide a workflow diagram showing on-chain and off-chain components.

3. **Implementation:**
    - Develop a working prototype or simulation of the proposed application.
    - Include at least one smart contract demonstrating core functionality.
    - Optional: Integrate external data (via oracles, APIs, or simulated IoT).

4. **Analysis:**
    - Evaluate scalability, cost, privacy, and regulatory implications.
    - Compare blockchain vs. traditional solutions for your chosen use case.

Evaluation Criteria

- **Technical Quality** – Functionality, code clarity, scalability
- **Innovation & Creativity** – Originality and novelty of the application
- **Analytical Depth** – Insight into challenges, feasibility, and ethics
- **Presentation, QA & Communication** – Clarity of demo, code/report structure, and visual design

Note

Remember: Your idea should **solve a real problem** using blockchain features effectively — *not just use blockchain for the sake of it!*

Suggested Tools & Platforms

- **Languages/Frameworks:** Solidity, Truffle, Hardhat, Web3.js or Ethers.js
- **Blockchains:** Ethereum, Polygon, or Hyperledger Fabric
- **Storage:** IPFS, Filecoin, or encrypted off-chain DB

Deliverables

- **Proposal (10%) [10/23/2025]**
    - 1 - 2 page system concept (problem + architecture)
    - Team Contract
- **Smart Contract Draft (5%) [11/06/2025]**
    - GitHub Repository with Readme
- **Midterm Progress Update (15%) [11/20/2025]**
    - Initial prototype demonstration (recorded 5-min video + GitHub Repository)
- **Final Project (70%) [12/04/2025]**
    - Project Demonstration (recorded 7-10 min video or live).
    - GitHub Repository (Code + Readme)
    - Technical report (4-8 pages) [**IEEE 2 Column Format**]:
        - Design architecture and smart contract logic.
        - Application relevance and potential impact.
        - Limitations, risks, and future improvements.

Team Formation

- **Group Size:** 4–5 students
- **Formation Method:**
    - Provide the group details in google sheet
    - Students should self-organize via **Slack/Ed Discussion/MS Teams channels**.
    - Require a **Team Contract** submission (roles, expectations, meeting frequency).
- Communication & Collaboration
    - Use **GitHub/GitLab** for code collaboration.
    - Use **Google Docs/Overleaf** for reports and shared writing.
    - Keep a **shared Project Log** (progress tracker, task allocation)