

Independent Study Proposal: Blockchain Development Curriculum

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Faculty Member: Jonathon Magana

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### **Learning Outcomes:**

- Document blockchain topics including Crypto Currency and Non-Fungible Tokens (NFTs)
- Create and deploy an Algorand Standard Assets (ASAs) in the Algorand developer ecosystem
- Reinforce understanding of blockchain development concepts by creating tutorial material
- Develop blockchain learning modules suitable for an MSOE senior (CS/SE)

### **Description of Independent Study:**

The purpose of this independent study is to develop a deep understanding of blockchain by developing examples, tutorials, and material suitable for use by a CS/SE MSOE senior. The examples will include lab-like exercises, including how to represent assets with blockchain using the Algorand Standard Asset feature. This material could be used as the basis for developing a technical elective course suitable for CS/SE seniors, and other students with previous courses in Data Structures and Network Protocols.

### **Proposed Method of Solution:**

The independent study will include an overview of blockchain and the Algorand developer ecosystem, and the creation of tutorial/learning materials.

### **Deliverables:**

In addition to weekly check-in with faculty coordinator about project progress, the following should be provided on or before the indicated week in the quarter (adjustments may be made by the faculty coordinator as needed)

#### **Proposed Course Material:**

- W1: Topics documented: History of Blockchains, Blockchain Essentials & Cryptography, Consensus Mechanisms
- W2: Topics documented: Proof-of-Work (PoW), Mining, Crypto Currency, Security Issues
- W3: Creation of a tutorial: Creating a blockchain currency from scratch using python
- W4: Topics Documented: Layer 2 Networks & Cross Chain Swaps, Soft/Hard Forks, Network Fees/Scaling
- W5: Topics Documented: Smart Contracts & Decentralized Applications, Ethereum & Smart Contract Platforms
- W6: Development of examples in Algorand/ASA, Non-Fungible Tokens (NFTs)
- W7: Continued Development of examples in Algorand/ASA , including creation of a Tutorial

- W8: Additional Crypto Currency tutorials and examples (Will be determined by the student and faculty coordinator together once a better understanding of the previous material in the course has been obtained)
- W9: Document Legal Issues and current developments in Blockchain
- W10: Preparation of Final Presentation

**Grading Criteria:**

Final Project: 50%

Weekly Deliverables: 25%

Final Presentation: 25%