Blockchain Technology and Cybersecurity: Course curriculum development

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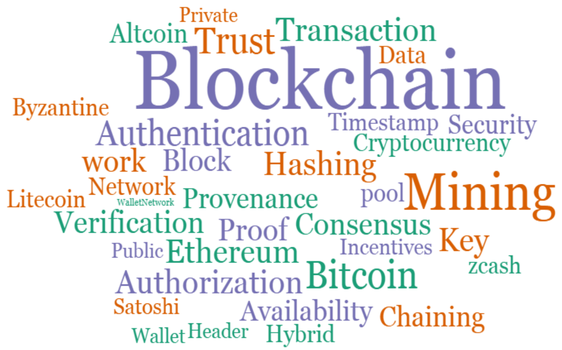
Project Goal & Objectives

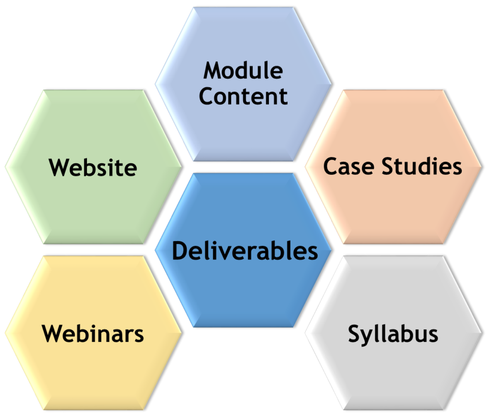
This course is designed to prepare students to the federal job market for postings require knowledge of Blockchain Technology and cyber security

At the conclusion of this course, the audience, students and the future developers who are involved in technological transformation will be able to:

- Explain how blockchain technology works
- Integrate blockchain technology into the current business processes to make them secure



Project Deliverables

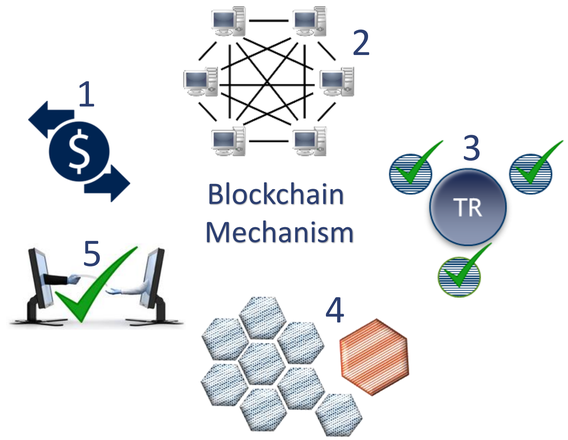


Course Content

Module	Micro-Module	Module Objectives
Module1 **Fundamentals of Blockchain Technology**	**Micromodule 1: Basics of Blockchain and Cryptocurrencies**	• Recall the basic terms about blockchain • Explain the advent of blockchain technology • Explain the evolution of blockchain technology • Explain the blockchain mechanism • Restate the advantages introduced by the blockchain technology • List the challenges of blockchain adoption • Distinguish different types of blockchains • Differentiate among cryptocurrencies
	Micromodule 2: Science of Blockchain	• Explain Byzantine Fault Tolerance • Distinguish Proof-of-Work and Proof-of-Stake concepts • Explain the underlying cryptographic concepts of blockchain • Explain how distributed computing works
Module2 **Blockchain Mechanisms for Architecting Business and Information Technology**	**Micromodule 3: Smart Contracts**	• Recall the basic terms about smart contract • Explain the advent of smart contract • Explain the smart contract mechanism • Restate the advantages introduced by the smart contract • List the challenges of smart contract • Explain different applications of smart contract • Implement hands-on the smart contract using solidity and Ethereum
	Micromodule 4: Blockchain Applications for Business	• Recall the basic terms about blockchain • Recall the basic terms about smart contract • Explain the applications of blockchain and smart contract in healthcare • Explain the applications of blockchain and smart contract in supply chain • Explain the applications of blockchain and smart contract in finance • Explain the applications of blockchain and smart contract in Voting
Module3 **Application of Blockchain to Boost Cybersecurity**	**Micromodule 5: Security of Blockchain Technology**	• Recall the basic terms of security • Explain the security of blockchain technology • Discuss the technical risks of the blockchain technology • Explain the inherent risks of the blockchain technology
	Micromodule 6: Blockchain Technology for Security	• Recall the basics of Cybersecurity • Explain the application of the blockchain technology to integrity and availability of the information • Explain the application of the blockchain technology to confidentiality and governance of the information

Blockchain Technology

Decentralized, Distributed, Digital ledgers



1. Transaction is requested
2. Request is transmitted to P2P Network
3. Nodes in network validate the transaction based on consensus protocol. Verified transaction is added to pervious transactions and create new block
4. New block is added to existing blocks- make unalterable chains of blocks
5. Transaction is DONE

BlockchainLab@ODU

The blockchain research lab at Engineering Management & Systems Engineering (EMSE) department of Old Dominion University (ODU) is dedicated to serve the university and the blockchain communities.

Mission: Conducting research on development of blockchain technology applications in Business, Finance, Economics, Mathematics, Computer Science, Engineering, and other related areas.

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https://sites.wp.odu.edu/blockchain/

Website