
INTRODUCTION WEB 3.0

Subject Code: STWB3A

Total Hours: 40

Credits: 4

Course Learning Objectives (CLO)

In recent months, you may have come across a phrase growing in popularity: Web3. What is all the hoopla about, how would it impact business and commerce going ahead, is there a thriving industry behind it? Why does the manager of the future need to be aware of this industry and technology underscoring these changes?

UNIT 1: Gateway to the world of Web

[10 hours]

- Blockchain basics
- What is a blockchain
- How does it work
- Hash rate and block information
- Core concepts of web3 like Decentralization and Permissionless network
- Nodes
- Types of Blockchains
- Bitcoin and the concept of store of value
- Ethereum and its ability to code smart contracts and build dapps
- L2s like Polygon
- Gaming blockchains like Axie Infinity
- Smart Contracts
- What is a Smart contract
- How it enables trustless, permissionless environment to do business
- Overview of Blockchain languages like Solidity and Rust
- Wallets
- Gateway to the world of web3
- Metamask
- Hardware wallets
- Tokenomics

- The foundational concept of creating and analyzing tokens creating a token economy
- How to analyze a project – White paper and Tokenomics

UNIT 2: Real World Applications of Blockchain Technology

[10 hours]

- How is blockchain disrupting finance: Decentralized Finance (Defi)
- What is DeFi
- Important concepts
- Automated market makers (AMM)
- On Chain and off-chain liquidity
- Liquidity mining
- Staking
- Leverage in DeFi
- Important projects in DeFi
- Uniswap
- Aave
- Balancer
- Yearn Finance
- Curve and Convex
- Case study: The Curve Wars
- Stable coins like Tether and DAI
- Case study: Luna (The rise and fall of Algorithmic stable coin UST)
- DeFi focussed chains
- Avalanche
- Fantom
- Defi use cases
- Asset management
- Borrowing and lending
- Synthetic assets and derivatives
- Payment solutions
- Future of Work: How is blockchain disrupting company structures and how we work
- Introduction to DAO (Decentralized autonomous organization)
- What is a DAO
- How is it different from a traditional company?

- To DAO or Not to DAO
- DAO Treasury
- DAO Tooling
- Introduction to Discord
- Types of DAOs
- Investment DAOs
- Collector DAOs
- Service DAOs
- Protocol DAOs
- Product DAO
- Media DAOs
- Impact DAOs
- Governance
- How are decisions made?
- Challenges in governance and mitigation strategies
- Contributions & Compensation
- Becoming a DAO contributor
- Common failures
- Case studies
- Future of art and communities: How is blockchain is enabling creators and revolutionizing art, sports and everything in between

UNIT 3: NFTs transforming internet transactions

[10 hours]

- NFT Overview
- What is a Non Fungible token (NFT)
- Gain a clear understanding of how NFTs are useful for artists, businesses, music, sports, content creators and technology
- What's a NFT marketplace?
- Introduction to OpenSea
- How did it all start – CryptoKitties
- Airdrops
- Case studies
- Case studies - NFTs In the Gaming Industry
- Dapper Labs and The NBA Topshot NFTs
- Examples of top-selling NFTs and what makes them unique

- Top selling NFTs From Beeple to The Nyan Cat
- BAYC
- Cryptopunks
- Goblin-town
- The NFT ecosystem overview
- Infrastructure
- Collectibles
- Domains
- Games and gamins Studios
- NFT in Defi and Metaverse

UNIT 4: Metaverse Environments: Future is here

[10 hours]

- Digital Twins and the brave new world of Metaverse
- Metaverse Basics
- What is the Metaverse?
- Why is Facebook (now Meta) betting the house on Metaverse. Oculus Headsets and its AR/VR Strategy
- Industries Disrupted by the Metaverse: Fashion, Marketing, Brands, Finance,
- Gaming, Architecture, Virtual Shows/Concerts, Art Galleries and Museums
- Case study: Nike acquires rtfkt, metaverse shoe company
- Why every corporate is racing to develop a metaverse strategy
- The biggest Metaverse projects
- Decentraland
- Sandbox
- Outerworld
- Roblox
- Digital Real estate
- Asset Classes Inside the Metaverse
- Metaverse Land Ownership - Property Investment
- Digital real estate ecosystem.

Course Outcomes: On completion of this course, students are able to:

- Working knowledge of Blockchain and use of smart contracts
- Deep dive into the cutting-edge landscape of decentralized finance
- Understanding the autonomous structure of DAOs and various voting methods
- Creating NFTs and navigating marketplaces
- In-depth understanding of industry-relevant Metaverse environment

SKILL BASED EXERCISE (SBE):

Note: - These Projects/activities are only indicative; the faculty member can innovate

Assignments/ Mini Projects on:

Mini Projects:

1. Blockchain Implementation: Develop a simple blockchain system using a programming language of your choice (such as Python). Include functionalities like block creation, hashing, and validation. Demonstrate how the blockchain maintains integrity and security.
2. Smart Contract Development: Use Solidity (blockchain programming language) to create a smart contract for a specific use case, such as a crowdfunding platform or a decentralized voting system. Implement the contract on a test network like Ethereum's Rinkeby testnet.
3. DeFi Application Analysis: Choose a popular decentralized finance (DeFi) protocol like Uniswap, Aave, or Compound. Research and analyze its functionalities, security measures, and user adoption. Prepare a report highlighting its impact on the traditional finance industry.

Assignments:

4. Tokenomics Analysis: Select a project that has its own native token. Analyze its tokenomics, including the token distribution model, inflation/deflation mechanisms, utility within the ecosystem, and potential economic impact. Write a comprehensive report discussing the strengths and weaknesses of tokenomics.

5. DAO Case Study: Choose a prominent Decentralized Autonomous Organization (DAO) like MakerDAO, Aragon, or MolochDAO. Investigate its governance structure, decision-making processes, and community participation. Assess the DAO's success factors and challenges, and provide recommendations for improvement.
6. NFT Marketplace Research: Explore different NFT marketplaces like OpenSea, Rarible, or SuperRare. Compare and contrast their features, fees, user experience, and security measures. Write a detailed evaluation report on the strengths and weaknesses of each marketplace.
7. Metaverse Business Strategy: Pick a specific industry, such as fashion, gaming, or real estate, and analyze how companies are integrating with the metaverse. Identify potential opportunities and challenges for businesses in this space. Develop a strategic plan outlining how a company can leverage the metaverse to enhance its brand and reach.

These mini projects and assignments will provide hands-on experience and in-depth understanding of the concepts covered in the course. Feel free to adjust them based on the duration and complexity suitable for your course.

Textbooks and Other Relevant References:

Since the provided course outline is specialized and for this specific course, it may not have a dedicated textbook available. However, we can recommend some resources and references that cover the topics related to Web3, blockchain technology, decentralized finance, and NFTs. These resources will provide you with valuable information and in-depth knowledge on the subject matter:

1. "Blockchain Basics: A Non-Technical Introduction in 25 Steps" by Daniel Drescher.
2. "Mastering Ethereum: Building Smart Contracts and DApps" by Andreas M. Antonopoulos and Gavin Wood.
3. "DeFi and the Future of Finance" by Campbell Harvey, Ashwin Ramachandran, and Joey Santoro.

4. "The Business Blockchain: Promise, Practice, and Application of the Next Internet Technology" by William Mougayar.
5. "Token Economy: How Blockchains and Smart Contracts Revolutionize the Economy" by Shermin Voshmgir.
6. "NFT Handbook: The Basics of Non-Fungible Tokens" by OpenSea.
7. "Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies is Changing the World" by Don Tapscott and Alex Tapscott.