

# CURRICULUM 2025

Finance • Philosophy • Technology



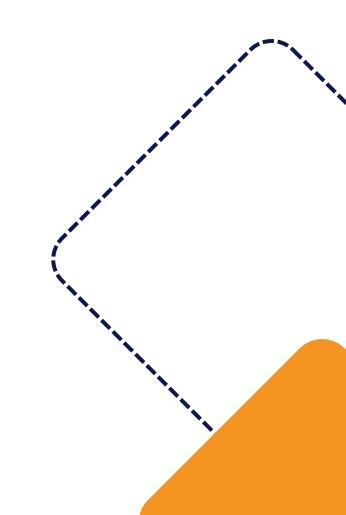
insert your country here!



# DOBJECTIVE

Awaken students' curiosity and guide them on an exciting journey of discovery into the world of Bitcoin. Through interactive games and hands-on projects with open-source software, they will learn the fundamentals of this technology, fostering their creativity and critical thinking.

Furthermore, they will develop the necessary skills to become future leaders who will build a more just and equitable world, where Bitcoin plays a key role as the global money of the future.





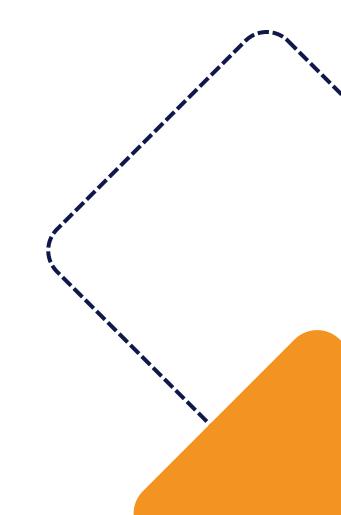
### D\_ PRESENTATION

# THE KIDS DESERVE FUN WHILE LEARNING BITCOIN!

Through fun games and hands-on projects, you will discover how Bitcoin works, from its origins to its most advanced applications, with the support of open-source resources, culminating in the installation of a Bitcoin node. In our course, divided into 7 blocks, we will explore a new aspect of Bitcoin each week for 4 hours.

**DURATION: 7 WEEKS** 

LEVEL: BASIC - INTERMEDIATE





# D\_ GENESIS BLOCK

"A good that is assigned the role of a widely accepted medium of exchange is called money."

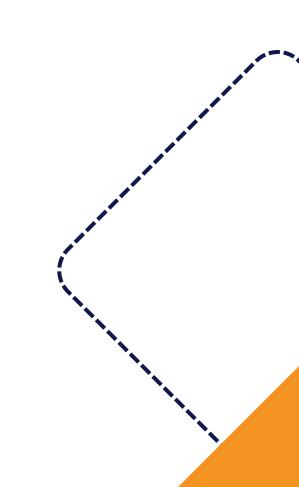
Saifedean Ammous / The Bitcoin Standard

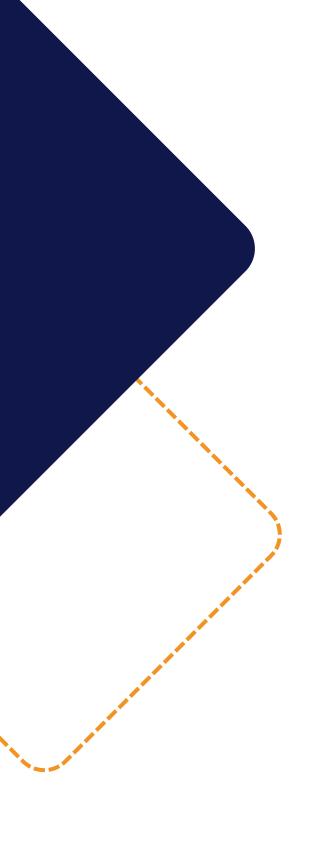
#### Block Objectives

- Let's become money detectives! We will explore the history of money and discover how it has evolved from bartering to the coins and bills we use today.
- Let's uncover the mysteries of inflation! We'll conduct fun experiments to understand how excessive money creation can affect prices, our savings, and the economy as a whole.

**DURATION: 4 HOURS** 

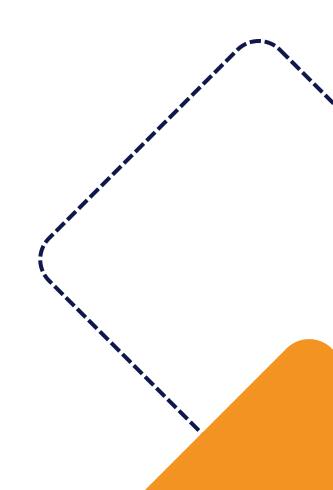
**LEVEL: BASIC** 







- Function of Money (BG-DA)
  - Store of Value
  - Medium of Exchange
  - Unit of Account
- Properties of Money (BG-DB)
  - Portability
  - Divisibility
  - Durability
  - Fungibility
  - Scarcity
  - Acceptibility
- Why should I care about Money? (BG-DC)
  - Dilution
  - Inflation / Deflation
  - Purchasing Power
  - Central Banks
  - Cantillon Effect
- There is hope, and it's orange!
  - Bitcoin solves all the problems of today's money



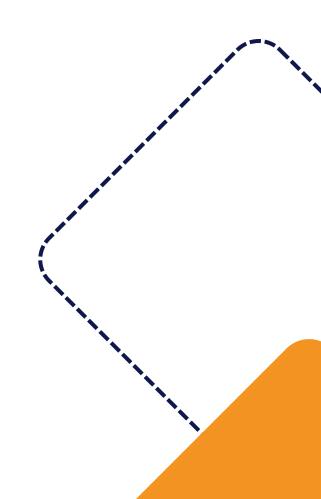


#### Practical Activities

- Video "Broken Money" (Spanish subtitiles) / Lyn Alden
  - The financial system is broken.
    - Barter Activity
- Drink Dilution Game
  - Understand money dilution
    - Drink Dilution Activity
- Barter Game
  - Understand the difficulty of finding a coincidence of wants.
- Video of Sound Food
  - How inflation affects our food and thus lowers our quality of life.

The failure of money impacts everything we do and everything we are

- an anonymous French person -



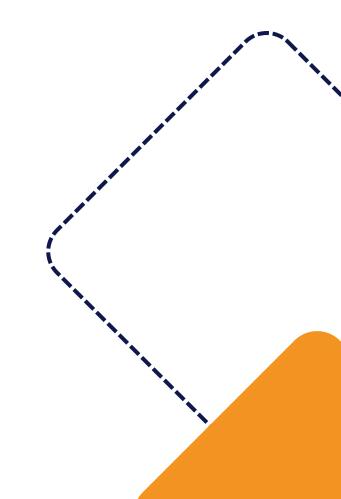
### D BLOCK ONE

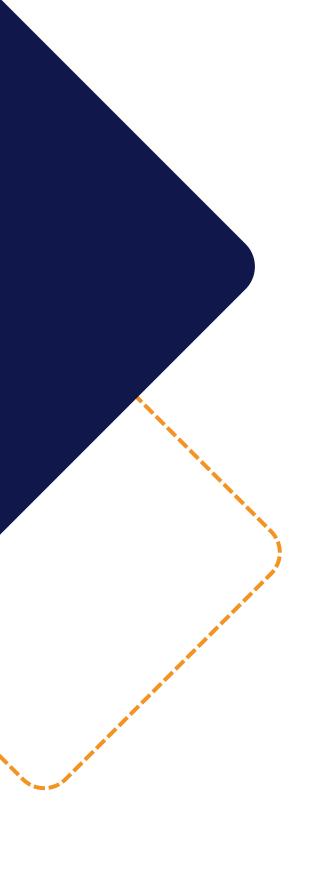
Therefore, privacy in an open society requires anonymous transaction systems. On anonymous system allows individuals to reveal their identity when they choose and only when they choose; this is the essence of privacy.

- Eric Hughes / Cyperpunk Manifesto -

#### • Block Objectives (I)

- Unveil the secrets of the cypherpunks and how they fought for a more private and secure world, and how their ideas gave rise to Bitcoin!
- Learn how to generate and use a Bitcoin key pair to sign and verify messages.







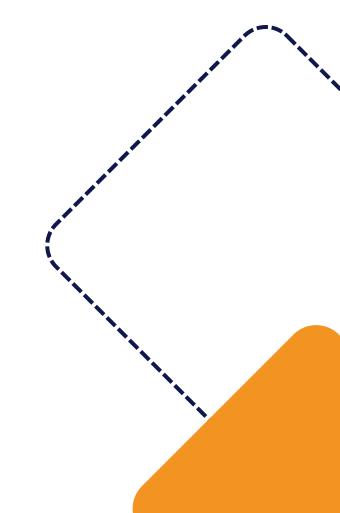
#### • Block Objectives (II)

- Explore the technologies underlying Bitcoin, such as asymmetric cryptography.
- Protect your Bitcoin with hrdware by discovering how hardware wallets ensure the security of your funds by securely storing your private keys.

**DURATION: 4 HOURS** 

LEVEL: INTERMEDIATE (IT IS NECESSARY TO KNOW THE ANSWER TO "WHAT IS

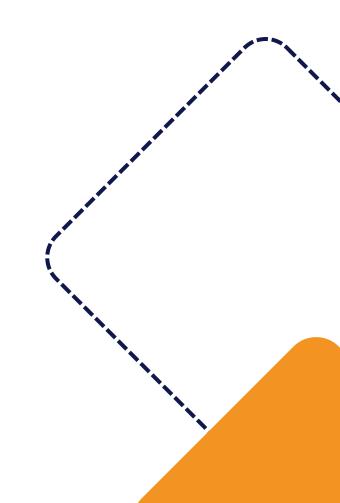
MONEY?")







- CypherPunk Manifesto (B01-CPA)
  - Privacy matters
- Technology that inspired Bitcoin (B01-CPB)
  - Some Bitcoin predecessors
    - Nick Szabo | BitGold
    - Wei Dai | B-Money
    - Adam Back | Hashcash
    - Halfiney | Reusable Proof of Work
  - Technology Preceding Bitcoin
    - Phil Zimmerman | PGP
    - Brahm Cohen | Bittorrent
- Elliptic Curve (B01-CPC)
  - Symmetric Cryptography
  - Asymmetric Cryptography (Public Key)
  - Secp256k1
- Let's play with keys (B01-CPD)
  - Generate keys to sign and verify meessages
  - Practice with a Hardware Wallet Simulator



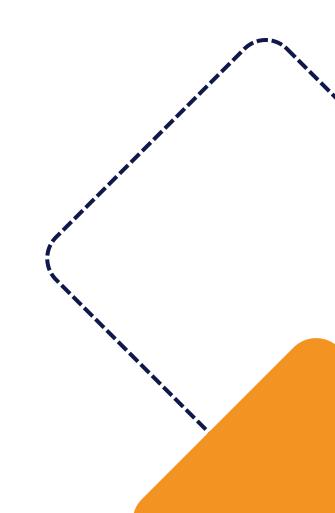


#### Practical Activities

- Creating points on the elliptic curve
  - Using a graphing calculator
- Signing and verifying with cryptography in Bitcoin
  - Creating Bitcoin Keys (Public / Private)
- Practice with Coldcard Q simulator
  - Simulator Installation
  - Creating a Bitcoin Private Key
  - Exporting to Sparrow Wallet

I was very interested to read your Hashcash paper. I am preparing a paper that expands on your ideas into a complete working system...

- Satoshi Nakamoto - / Email to Adam Back





...transactions must be publicly announced, and we need a system for participants to agree on a single history of the order in which they were received.

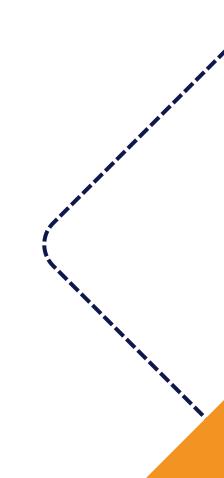
- Satoshi Nakamoto / Bitcoin White Paper-

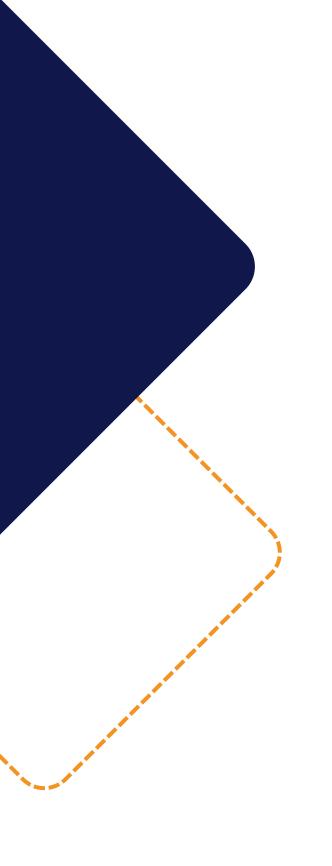
#### Block Objectives

- We will explore how Bitcoin keeps an immutable record of all transactions on a blockchain and why this is so secure.
- We will discover how transactions are carried out in Bitcoin, what a block is, what information it contains, and how blocks are verified to ensure security.
- We will learn about the SHA-256 algorithm and how it is used to secure the Bitcoin network
- We will understand what a Bitcoin node is an how each node contributes to the security and decentralization of the network.

**DURATION**: 4 HOURS

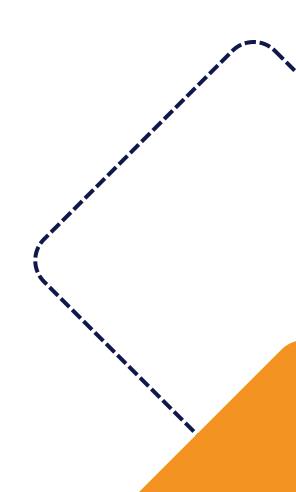
**LEVEL:** INTERMEDIATE (IT IS NECESSARY TO KNOW THE PREDECESSORS OF BITCOIN)







- Bitcoin Transactions (B02-TXA)
  - Digital Signatures
  - UTXOs (Unspent Transaction Outputs)
- Bitcoin Blocks (B02-TXB)
  - Transactions in a Block
  - Block Header
    - Version
    - Previous Block Hash
    - Merkle Root
    - Timestamp
    - Nonce (Number used Once)
    - Bits
  - Hash Security Algorithm (SHA256) (B02-TXC)
    - Practice with the SHA256 algorithm bits
    - Practice with Blockchian Simulator
- Bitcoin Node
  - What is a Bitcoin Node and what does it do?
  - First look at the topic of Open Source



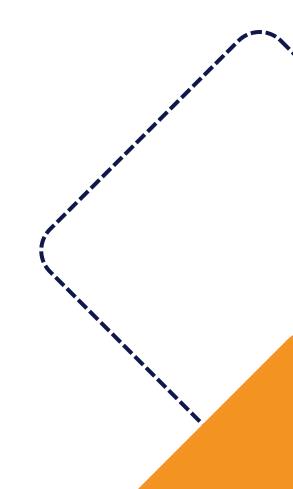


#### Practical Activities

- Practice with the SHA256 algorithm
  - We will create a fixed 32-byte message
  - We will learn the importance of collision resistance
- Practice exploring the Genesis Block
  - We will review Bitcoins first block from 03/JAN/09
- Practice with Blockchain Simulator
  - We will understand how blocks are linked together

The network timestamps transactions into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work.

- Satoshi Nakamoto - / Bitcoin White Paper







This is a free and open-source project that allows you to try mining a Bitcoin block with a small hardware device. The main goal of this project is to enable you to learn more about mining and to have a beautiful hardware device on your desk.

- Bit Maker / Creator of Nerdminer -

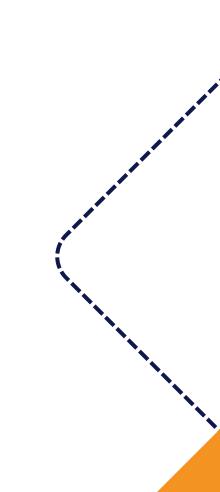
#### Block Objectives

- Bitcoin 101: We will explore how Bitcoin transactions are grouped into blocks while installing a node.
- We will learn how new Bitcoin coins are created and how we can participate in this process, even on a small scale.
- We will use an ESP32 to create a small Bitcoin miner and understand how the network works.

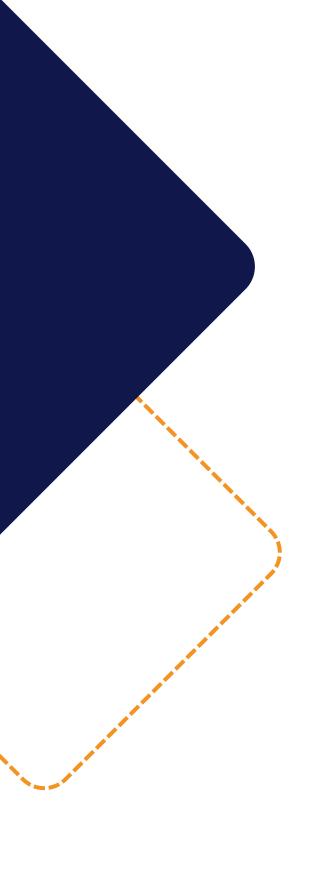
**DURATION:** 4 HOURS

LEVEL: INTERMEDIATE (IT IS NECESSARY TO KNOW WHAT A BITCOIN BLOCK IS

AND ITS COMPONENTS)

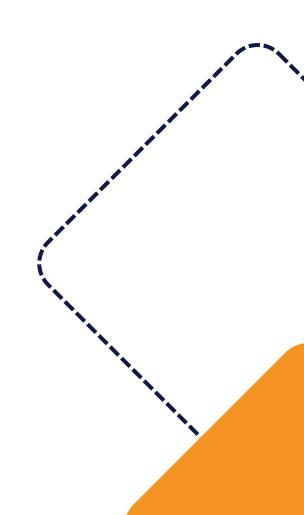








- Bitcoin 101 (B03-MA)
  - Brief overview of transactions and blocks
  - Different Bitcoin nodes
  - Install a Bitcoin node
- Mining Concepts (I) (B03-MB)
  - Block Reward
  - Mempool (unconfirmed transaction pool)
  - Block Template
  - Number used once (Nonce)
  - Merkle Root
  - Miner
  - Mining Stack
- Flash Nerdminer on a ESP32 device (B03-MC)
  - Open Source review (Github)
  - Generating a Bitcoin address
  - Setting up a NerdMiner on a public Bitcoin Mining Pool



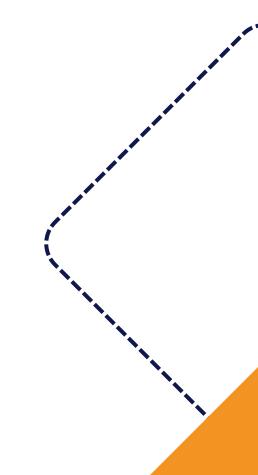


#### Practical Activities

- o Install a Bitcoin node
  - Download Bitcoin Core
  - Start synchronization with the network
- Flash an ESP32 (install Nerdminer)
  - Create a Bitcoin address
  - Review the project's Github
  - Use a public pool as a mining stack
  - Downoad a CP2102 Driver
  - Configure the ESP32 WROOM device

This adds an incentive for nodes to support the network, and provides a way to initially distribute coins into circulation, since there is no central authority to issue them.

- Satoshi Nakamoto - / Bitcoin White Paper







Bitcoin mining is simpler than you think! It's a guessing game where you look for a magic number that, when added to a block, produces a valid proof of work.

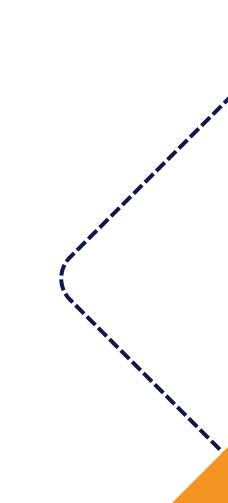
- D-plus-plus / Bitcoin mining simulator -

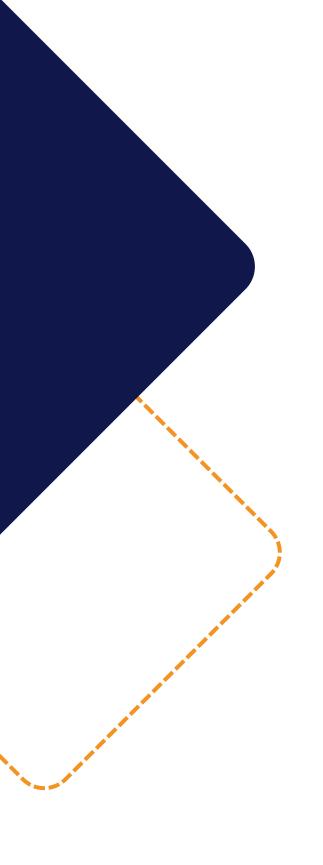
#### Block Objectives

- We will discover how Bitcoin mining has changed over time and why it is so important for keeping the network secure and decentralized.
- We will learn terms like "difficulty," "halving," and "hashrate"
  and how they affect Bitcoin mining.
- We will use a simulator to experience firsthand how a block is mined in Bitcoin.

**DURATION: 4 HOURS** 

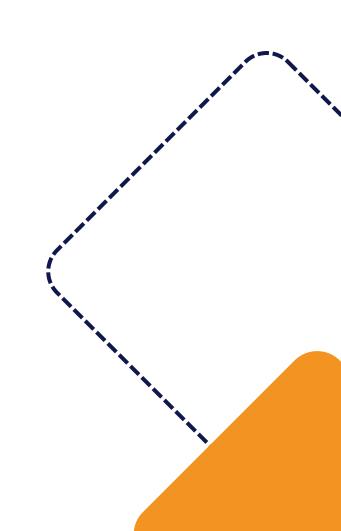
LEVEL: ADVANCED (IT IS NECESSARY TO KNOW BASIC MINING CONCEPTS)







- Evolution of Bitcoin Mining (BO4-DA)
  - CPU, GPU, FPGA y ASIC
- Mining Concepts (II) (B04-DB)
  - Hash Rate
  - Difficulty and Difficulty Adjustment
  - Mining Pool and Shares
  - SHA256: How is it used in Mining?
  - Halving
    - Bitcoin Supply Equation
- Competition with an Online Mining Simulator (B04-DC)
  - Let's learn concepts while playing!
    - Network Difficulty
    - Block Reward
    - Nonce

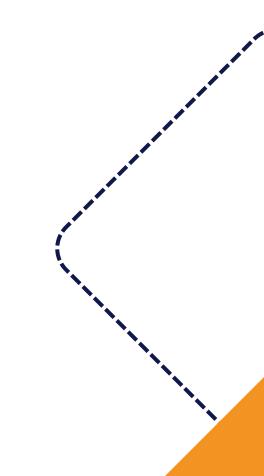




- Let's solve the Bitcoin supply equation.
  - Math supports Bitcoin, and we're going to prove it by solving the Bitcoin supply equation.
- o Let's play as Miners!
  - We will learn mining with an online mining simulator that allows you to adjust the network difficulty and add a nonce to find a Bitcoin block.

If many people do this, then we all play a signinficant role in decentralizing the hash rate and enduring censorship resistance, for which Bitcoin is so famous.

- Skot - / Bitaxe





To achieve much more than 47,00 transactions per second with Bitcoin, it is necessary to conduct transactions outside of Bitcoin's own blockchain.

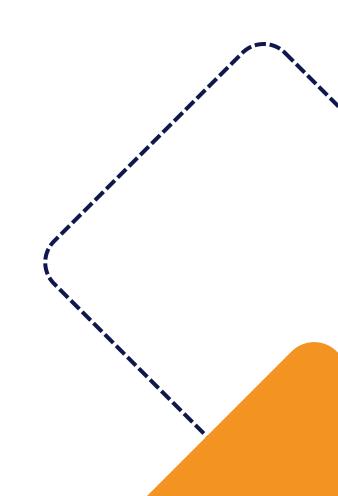
- Joseph Poon, Thaddeus Dryja / Lightning Network Paper -

#### Block Objectives

- We will learn about the Lightning Network in three different ways:
  - Airport analogy
  - Technical description of the network
  - "LN Ropes and Hair Ties" Game
- Setting up a Lightning Network infrastructure
  - Polar Lightning Network
  - GetAlby extension
  - Zeus Wallet LN

**DURATION: 4 HOURS** 

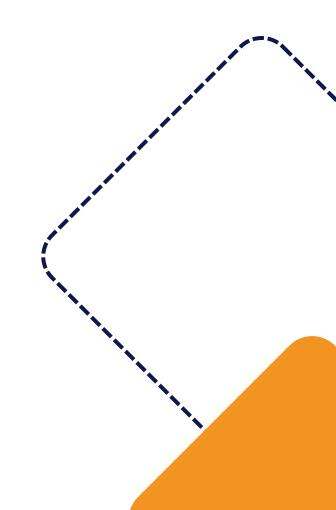
LEVEL: ADVANCED (IT IS NECESSARY TO KNOW BITCOIN AND MINING)







- Lightning Network: Airport Analogy (B05-LNA)
  - Learn the basics of Lightning Network
- Lightning Network: Technical Description (B05-LNB)
  - Implementations and nodes
  - Payment Channels
  - Liquidity Management
  - Payment Routing
  - HTLC (Hash Time-Locked Contracts)
- Setting up LN Infrastructure (B05-LNC)
  - Lightning Network Polar
    - Bitcoin node Installation (Regtest)
    - Lightning LND node Installation
  - GetAlby extension installation
    - Certificate and Macaroon installation
    - Connect LND node to web extension
  - Zeus LN installation
    - Connect LND Node to Mobile Wallet
    - Macaroon installation

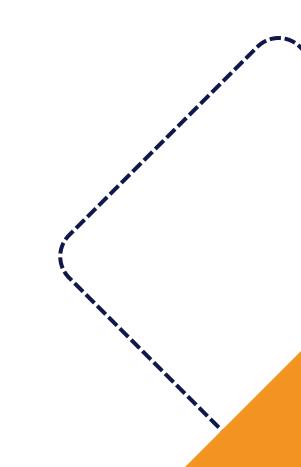




- Let's play with Lightning Polar!
  - Create Bitcoin and Lightning Network Nodes
  - Install GetAlby Web Extension
  - Install Zeus Mobile Lightning Network App
  - Connect nodes to the extension and the app
  - Make transactions in the classroom with your peers
- Let's play at creating a lightning network!
  - Create a network of students actions as a Lightning Network Nodes to reinforce concepts such as:
    - Total Capacity
    - Inbound Capacity / Outbound Capacity

Censorship in the modern world is the algorithmic amplification of certain messages and ideas and the suppression of other messages and ideas.

- Matt Hill - Start9



## D BLOCK SIX

We can guarantee opportunities for everyone, but not that everyone will succeed...

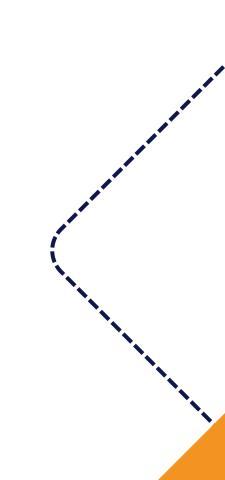
- Max Keiser -

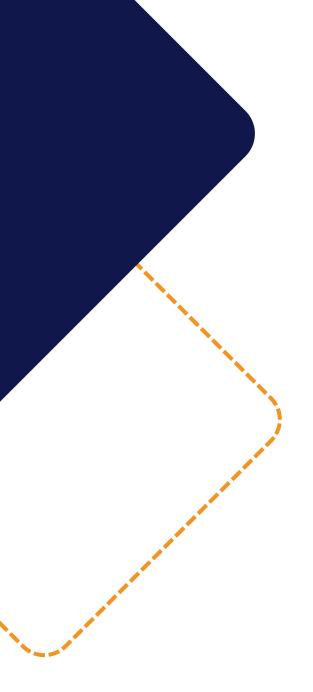
#### Block Objectives

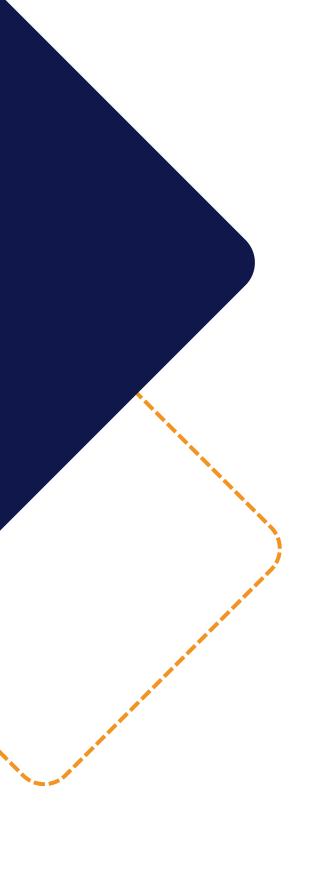
- Install a Bitaxe miner and understand why it is important for many different people to participate in mining.
- GPG Workshop
  - We will learn how to create RSA keys and send encrypted messages.
  - We will use digitial signatures to verifiy the authenticity of the documents and messages.
- We will take a fun quiz to review everything you've learned about Bitcoin.

**DURATION: 4 HOURS** 

LEVEL: ADVANCED (IT IS NECESSARY TO KNOW BITCOIN / LIGHTNING NETWORK)

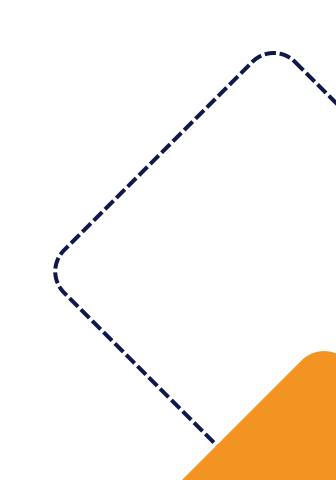








- Bitaxe Installation (B06-ZA)
  - Brief description of the hardware and it's history.
  - Installation of "Ride the Lightning"
    - (Bitcoin Node Graphical Interface)
  - Public Pool Installation
  - Bitaxe Configuration
- GPG Workshop (B06-ZB)
  - Brief history of the predecessor PGP (Phil Zimmermann)
  - RSA key creation
  - Encrypt / Decrypt files
  - Sign and verify files
- Next steps as a Node Nation student (B06-ZC)
  - Listen to Podcast (Español)
    - Lunaticoin Podcast
    - 402 payment required Channel
  - Stack Sats
    - Stacker news
    - Thunder Games / ZBD games
    - Fountain App
- Bitcoin Knowledge Quiz (B06-ZX)

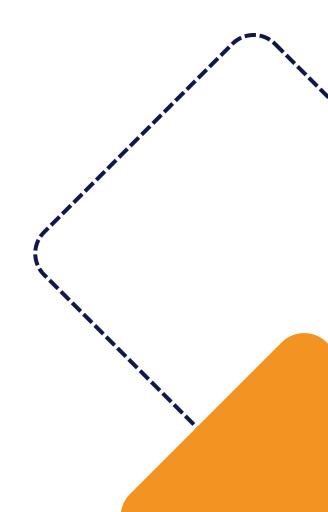




- Bitaxe Installation
  - Configure the Bitaxe for solo mining from our own node.
  - Set up the Bitaxe hardware to mine bitcoin using pulic pool software
- GPG Workshop
  - Create a key pair to encrypt and decrypt files.
  - Sign and verify signatures

Never in my wildest dreams did I think I would one day travel to El Salvador, and yet here I am...

- Stacy Herbert -





**ALL PREVIOUS COURSEWORK** 



### > SUBJECT TABLE

BG B01 B02 B03 B04 B05 B06 BASIC INTERMEDIATE INTERMEDIATE INTERMEDIATE ADVANCED ADVANCED ADVANCED B02-TXA B04-DA B05-LNA **B06-ZA BG-DA** B01-CPA BO3-MA NONE BG-CD B01-BD NONE B02-TXA B02-TXB B04-DB B03-MC INTERMEDIATE INTERMEDIATE ADVANCED **BASIC** INTERMEDIATE ADVANCED **ADVANCED BG-DB** B01-CPB B02-TXB **B03-MB** B04-DB B05-LNB B06-ZB B01-BA B03-MA B03-MB B05-LNA B06-ZA BG-AD B02-TXA **BASIC** INTERMEDIATE INTERMEDIATE INTERMEDIATE **ADVANCED ADVANCED** ADVANCED B06-ZC **BG-DC** B01-CPC B02-TXC B03-MC B04-DC B05-LNC BG-BD B01-BB B02-TXB B02-TXB B02-TXC B03-MA B05-LNB NONE INTERMEDIATE ADVANCED B06-ZX

B01-CPD