

# Detailed Course Outline

*Work In Progress*

*Feedback Is SUPER WELCOME, drop me an e-mail [here](#), Thanks!*

## 1. Introduction

This Specific Course Would Be Tailored To Younger Individuals With An Interest In Computer Science (perhaps they're entering their first year or University).

### 1.1 Course Structure

- **Course Outline:**
  - **Guide For CS UnderGrads: Introduction to Cardano.**
    - **Basic Introduction To Computation, Data-Structures & Algorithms:**
      - **Kind of a primer, IFF CS UG THEN: Assumed Knowledge: Linked-Lists, etc...**
      - **Deterministic Finite Automata (DFA) & Nondeterministic Finite Automaton (NFA)**
      - **$P = NP$  | NP Hard | NP Complete**
    - **Basic Introduction to Networking:**
      - **We are keeping this one real basic...**
      - **(Work To Do Here...)**
    - **Introduction to Distributed Systems (+ Basic Game Theory | Byzantine Generals Problem):**
      - **Eight Principals You Should Never Forget About (Network Based) Distributed Systems**
      - **Transactions Within Distributed Systems**
      - **Concurrency Control Within Transactions**
      - **Semaphores**
      - **'Co-Ordinators'**
      - **Deadlock**

- *Phantom Deadlock*
- *Decentralised Systems*
- *Introduction to Byzantine Fault Tolerance*
- *The Byzantine Generals Problem*
- *Introduction to Novel Consensus Algorithms*
  
- *Introduction to Cryptography 1 & 2:*
  - *1: Basic Number Theory*
  - *1: Basic Hashing Algorithms: SHA\_256, MD5 (+ Background)*
  - *1: Introduction to Hash Collision Resilience & One-Way Hashing Algorithms*
  - *1: Factor of Two Primes: p and q*
  - *1: Introduction to AES and RSA*
  - *1: RSA: Public-Private Key Cryptography*
  - *1: Introduction to Digital Signatures*
  - *-*
  - *2: More On Digital Signatures*
  - *2: PKI*
  - *2: More On Hashing Algorithms: RIPEMD-160, CRC32, BLAKE-Variant Hashes...*
  - *2: Elliptic-curve cryptography (ECC)*
  - *2: (OPTIONAL) KEK & DEK*
  
- *Introduction to Distributed Ledger Technologies 1.0*
  - *(IN PROGRESS - CURRENTLY AN UNORDERED LIST)*
  - *What Is A Distributed Ledger Technology That Utilises Consensus?*
  - *Remember: Linked-Lists*
  - *Introduction To The Blockchain Data Structure*
  - *Considerations: A Block*
  - *How To Maintain Immutability*
  - *Merkle Trees*
  - *...*
  - *Addressing: Encoding Hash Output, e.g... base58*
  - *I will require time to build out this course...*
  
- *Introduction to Distributed Ledger Technologies 2.0*
  - *(IN PROGRESS - CURRENTLY AN UNORDERED LIST)*
  - *Developing on Cardano*
  - *I will require time to build out this course...*
  
- *Advanced DLTs*

- *(IN PROGRESS - CURRENTLY AN UNORDERED LIST)*
- *Porting The EVM to Cardano Using IELE => KEVM*
- *Looking Forwards: Building Compilers II Porting X-VMs to Cardano*
- *I will require time to build out this course...*

## 2. Resources

1. <https://youtu.be/JG2ESDGwHHY> | Fallacies of Distributed Computing