

Course Description

Code Breaking:

Do you have what it takes to be a spy? In this course, you will be introduced to cryptography, or the study of sending and receiving secret messages. From the beginning of time, people have always wanted to keep information safe. Now more than ever, we are looking for new ways to keep information private and secure. Come learn about various ciphers used throughout history and how we can use mathematics, logic, and a little bit of luck to break them.

Syllabus

Course Objectives:

- Acquire new mathematical skills applicable to cryptography and code breaking.
- Analyze the mathematics behind cryptography and code breaking.
- Explore the field of cryptography from both a historical and mathematical perspective.

Assignments and Evaluation:

- Problem Solving - Encrypt and decrypt secret messages and use cryptanalysis techniques to break codes without a key.
- Discussions - Class discussions about the mathematics behind encryption, decryption, and code breaking.
- Project - Create a cipher and prepare a presentation the strengths and weaknesses.

Course Outline:

- Third Person Introduction
- Icebreaker: Human Machine
- Rules and Expectations
- Warm Up: Decrypt NVVK TVYUPUN (GOOD MORNING)
- Historical Overview
- Introduction to Cryptography
 - Definitions
 - Notation
- Substitution Ciphers
 - Pigpen Cipher
 - Encryption and Decryption
 - Codebreaking
 - Atbash Cipher
 - Encryption and Decryption
 - Codebreaking
 - Caesar Cipher
 - Cipher Wheel
 - Encryption and Decryption
 - Codebreaking
 - General Substitution Cipher
 - Encryption and Decryption
 - Codebreaking
- Break
- Vigenere Cipher
 - Encryption and Decryption
 - Codebreaking

- Lunch
- Binary
 - Count the Dots
 - Binary to Decimal
 - Decimal to Binary
 - Binary Alphabet
 - ASCII and Unicode
 - Letters to Binary
- Logical Operators
 - AND, OR, XOR
 - XOR Cipher
 - Encryption and Decryption
 - Codebreaking
- Transposition Ciphers
 - Column Transposition
 - Encryption and Decryption
 - Codebreaking
 - Rail Fence Cipher
 - Encryption and Decryption
 - Codebreaking
 - Route Cipher
 - Encryption and Decryption
 - Codebreaking
 - Scytale
 - Encryption and Decryption
 - Codebreaking
- Break
- Mini Project: Create a Cipher
 - Work on Project
 - Presentations
- Playfair Cipher
 - Encryption and Decryption
 - Codebreaking
- Steganography
- Evaluations and Certificates