




Required Resources

Textbook: *Introduction to Cryptography With Coding Theory*

Read the following chapters and sections of the textbook:


- Chapter 1 (entire chapter)
- Chapter 2 through section 2.7: Enigma
- Appendix C, section C.1

This assigned reading introduces the field of cryptology: the practice of protecting information and electronic systems from unauthorized access or interception. In our modern world, the need for sophisticated encryption methods to secure sensitive data, such as credit card numbers, is more crucial than ever, making cryptography a vital field of study and research. The first ciphers presented focus on older cryptosystems that were invented and used before the advent of modern computers. While these older methods are no longer effective today, they serve as important examples for demonstrating key concepts of cryptology.

Video: The Caesar Cipher  (<https://www.khanacademy.org/math/applied-math/cryptography/crypt/v/caesar-cipher>)


This video explores the most elementary shift cipher, famously used by Julius Caesar over 2,000 years ago.

Students may experience varying amounts of time for this resource to load, depending on the speed of their internet connection. This video is 2 minutes and 35 seconds in length.

Video: Polyalphabetic Cipher  (<https://www.khanacademy.org/math/applied-math/cryptography/crypt/v/polyalphabetic-cipher>)

This video explores the next level of complication in ciphers. Polyalphabetic ciphers use a shift word rather than a shift number.

Students may experience varying amounts of time for this resource to load, depending on the speed of their internet connection. This video is 2 minutes and 26 seconds in length.

Video: The Enigma Encryption Machine  (<https://www.khanacademy.org/computing/computer-science/cryptography/crypt/v/case-study-ww2-encryption-machines>)


This video explores the Enigma machine, which implemented a polyalphabetic cipher via rotary wheels. The video also analyzes the Allied forces' approach to breaking the Enigma codes used by the

Germans in World War II.

Students may experience varying amounts of time for this resource to load, depending on the speed of their internet connection. This video is 10 minutes in length.


Video: How to Use the Vigenère Cipher  (<https://www.youtube.com/watch?v=K1SuiUu4kG0>) (4:00)

This video explains encryption and decryption using the Vigenère cipher and provides a quick exercise to test your understanding.

Video: Affine Cipher  (<https://www.youtube.com/watch?v=-7KL5u56upw>) (15:43)

This Grand Valley State University video explains the affine cipher in depth, working with modular arithmetic base 29.

A captioned version of this video is available: Affine Cipher (CC).  (<https://youtu.be/dgiD1aCMTMA>)

A video transcript is available: Transcript for Affine Cipher. 

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