



Encryption

Multimedia, data and HW security

❖ Course overview

Studying Cryptography is one of the best methods to understand how everything is secured around us. This course will help you understand how encryption works from History to algorithms. You will understand how to use encryption to secure data and multimedia. You will also be able to simulate and implement both encryption and decryption techniques using simulation techniques.

❖ Type of Delivery

Instructor-Led Training

❖ Duration

5 Weeks – 3 Sessions per week
3 hours/ Session

❖ Training Benefits

- Professional Instructor
- Professional Presentations
- Software Simulation
- Software Emulation
- Exam & Final Project
- CEUs certificate for Professional Engineers
- Special discount for IEEE members
- Internationally recognized certificate

❖ Course Objectives

- To discuss the basics of Information security.
- To discuss the basics of multimedia.
- To study the basics of data hiding techniques.
- To study the digital encryption and decryption techniques.
- To simulate encryption/decryption techniques.
- To implement encryption/decryption techniques.



❖ A few of the covered topics are

- Introduction to Cryptography
- Applications of Encryption
- Authentication
- Data Protection
- Virtual Private Networks
- Multimedia and Data Security
- Multimedia Data Types
- Multimedia Systems
- Text and Static Data
- Images
- Video Sequence
- Audio Sequence
- Data Security Techniques
- Encryption vs. Watermarking
- Encryption Process
- Watermarking and Steganography
- Stream Cipher Techniques
- Block Cipher Techniques

- Block Cipher Modes
- Block Cipher Algorithms
- DES, Lucifer, FEAL, RCA, Blowfish, RC5 etc
- Theory of Block Cipher Design
- Block Cipher vs. Stream Cipher
- Simulation Result for Texts with RC4
- Simulation Result for Images with RC4
- Simulation Result for Texts with RSA
- Simulation Result for Images with RSA
- Simulation Results for Texts with Caesar
- VHDL Overview
- Programmable Array Logic
- FPGA Array
- Complex Programmable Logic Device
- Shift-Register
- Divider
- Random Access Memory- RAM
- Logic Cells
- FPGA Program Creation
- FPGA vs. ASIC Design Flow
- FPGAs vs. ASICs vs. Processors
- Building Algorithms using MatLab
- Simulate VHDL codes
- Importing data to FPGA
- Synthesis and Download

❖ Target Audiences

This course is Suitable for Communications Engineering students at level 3 and 4 and newly admitted engineers. It is suitable also for Computer Engineering students at level 3 or 4 or newly admitted engineers.

❖ Prerequisites

Candidate should be familiar with digital signal processing, digital image processing and numbers theory. Knowledge of Matlab is highly recommended.

❖ Course certification

Upon successfully completing course assessment, quizzes, final project and exam, you will be eligible to get your internationally recognized certificate. This course is offering CEUs from IEEE and IACET for more information: www.ieee.org/partners

❖ About the Instructor

This course is delivered by **Dr. Mohamed Abdel Azim**. He is currently an assistance professor at Mansoura University. He has wide experience of teaching Electronics and Communications Engineering courses in various Universities in Egypt.

<http://mansvu.mans.edu.eg/cv/en/showcv.php?id=5063>

❖ Course References

- Bruce Schneier, “Applied Cryptography, Second Edition: Protocols, Algorithms, and Source,” John Wiley, 2006.
- T. Jin, “Living with Your Three-Headed Dog,” Document Number IAG-90-012, Hewlett-Packard, May 1990.
- D. Kahn, *The Codebreakers: The Story of Secret Writing*, New York: Macmillan Publishing Co., 1967.