



Certified Information Systems Security Officer

KEY DATA

Course Name: Certified ISSO or C)ISSO

Duration: 5 days Language: English

Format:

- Instructor-led classroom
- Computer Based Training
- Live Virtual Training

Prerequisites:

- 1 Year experience in at least 2 modules or
- 1 year in IS Management

Student Materials:

- Student Workbook
- Student Prep Guide

Certification Exams:

- Mile2 C)ISSO -**Certified Information Systems Security** Officer
- Covers CISSP® 2015 exam objectives

CPEs: 40 Hours

WHO SHOULD ATTEND?

- IS Security Officers
- IS Managers
- **Risk Managers**
- Auditors
- Information Systems Owners
- IS Control Assessors
- **System Managers**
- Government

COURSE OVERVIEW

M2's vendor neutral Certified Information Systems Security Officercertification training was a direct initiative of the DND - Department of National Defence of Canada in cooperation with the DOD - Department of Defense of the United States; defined in the dual initiative titled CANUS CDISM MOU - ID#: 1974100118

http://www.state.gov/documents/organization/1 11449.pdf. In the CANUS CDISM MOU, it stated the following:

- The CDRSN National Information System Security Officer (ISSO) is the focal point for all security issues pertaining to this network.
- The Director Information Management Security (DIMSECUR) is the DND authority for security assessment of the CDRSN, including the approval of Interim Authority to Process (IAP) and Authority to Communicate.

With these initiatives in mind, Mile2 created the Certified ISSO.

The CISSO addresses the broad range of industry best practices, knowledge and skills expected of a security manager/officer. The candidate will learn in-depth theory pertaining to the practical implementation of core security concepts, practices, monitoring compliance in the full panorama of IS management. Through the use of a riskbased approach, the CISSO is able to implement and maintain cost-effective security controls that are closely aligned with both business and industry standards.

responsible Whether you're management of a Cyber Security team, a Security Officer, an IT auditor or a Business Analyst, the C)ISSO certification course is an ideal way to increase your knowledge, expertise and skill.

Foundational Career



All combos Include:

- Online Video
- **Electronic Book** (Workbook/Lab guide*)

*in all technical classes

- **Exam Prep Questions**
- Exam



















ACCREDITATION

The CISSO certification has been validated by the NSACNSSI-4012, National Information Assurance as well as the Training Standard for Senior System Managers and NSTISSI - 4011, National Training Standard for Information Systems Security (INFOSEC).







UPON COMPLETION

Upon completion, **Certified Information Systems Security Officer** students will not only be able to establish industry acceptable Cyber Security & IS management standards with current best practices but also be prepared to competently take the CISSO exam.

EXAM INFORMATION

The Certified Information Systems Security Officer exam is taken online through Mile2's Assessment and Certification System ("MACS"), which is accessible on your mile2.com account. The exam will take 2 hours and consist of 100 multiple choice questions. The cost is \$400 USD and must be purchased from Mile2.com.



COURSE CONTENT

Module 1: Risk Management
Module 2: Security Management

Module 3: Identification and Authentication

Module 4: Access Control

Module 5: Security Models and Evaluation Criteria

Module 6: Operations Security

Module 7: Symmetric Cryptography and Hashing Module 8: Asymmetric Cryptography and PKI

Module 9: Network Connections

Module 10: Network Protocols and Devices Module 11: Telephony, VPNs and Wireless

Module 12: Security Architecture and Attacks Module 13: Software Development Security

Module 14: Database Security and System

Development

Module 15: Malware and Software

Attacks

Module 16: Business Continuity
Module 17: Disaster Recovery

Module 18: Incident Management, Law,

and Ethics

Module 19: Physical Security





















DETAILED MODULE DESCRIPTION

Module 1 - Risk Management

What Is the Value of an Asset?

What Is a ThreatSource/Agent?

What Is a Threat?

What Is a Vulnerability?

Examples of Some Vulnerabilities that Are Not Always

Obvious

What Is a Control?

What Is Likelihood?

What Is Impact?

Control Effectiveness

Risk Management

Purpose of Risk Management

Risk Assessment

Why Is Risk Assessment Difficult?

Types of Risk Assessment

Different Approaches to Analysis

Quantitative Analysis

ALE Values Uses

Qualitative Analysis - Likelihood

Qualitative Analysis - Impact

Qualitative Analysis - Risk Level

Qualitative Analysis Steps

Management's Response to Identified Risks

Comparing Cost and Benefit

Cost of a Countermeasure

Module 2 - Security Management

Enterprise Security Program

Building A Foundation

Planning Horizon Components

Enterprise Security – The Business Requirements

Enterprise Security Program Components

Control Types

"Soft" Controls

Technical or Logical Controls

Physical Controls

Security Roadmap

Senior Management's Role in Security

Negligence and Liability

Security Roles and Responsibilities

Security Program Components

Security and the Human Factors

Employee Management

Human Resources Issues

Importance to Security?

Recruitment Issues

Termination of Employment

Informing Employees

About Security

Enforcement

Security Enforcement Issues

Module 3 - Authentication

Agenda

Access Control Methodology

Access Control Administration

Accountability and Access Control

Trusted Path

Who Are You?

Authentication Mechanisms

Strong Authentication

Authorization

Access Criteria

Fraud Controls

Access Control Mechanisms

Agenda

Biometrics Technology

Biometrics Enrollment Process

Downfalls to Biometric Use

Biometrics Error Types

Biometrics Diagram

Biometric System Types

Agenda

Passwords and PINs

Password "Shoulds"

Password Attacks

Countermeasures for Password Cracking

Cognitive Passwords

One-Time Password Authentication

Agenda

Synchronous Token

Asynchronous Token Device

Cryptographic Keys

Passphrase Authentication

Memory Cards

Smart Card

Agenda

Single Sign-on Technology

Different Technologies

Scripts as a Single Sign-on Technology

Directory Services as a Single Sign-on

Technology

Thin Clients

Kerberos as a Single Sign-on Technology

Kerberos Components Working Together

















CYBER SECURITY CERTIFICATIONS

Decentralized Access Control Administration

Module 5 - Security Models and Evaluation Criteria

System Protection - Trusted Computing Base

System Protection-Reference Monitor

Security Kernel Requirements

Security Modes of Operation

System Protection

Levels of Trust

System Protection- Process Isolation

System Protection - Layering

System Protection - Application Program Interface

System Protection- Protection Rings

What Does It Mean to Be in a Specific Ring?

Security Models

State Machine

Information Flow

Bell-LaPadula

Rules of Bell-LaPadula

Biba

Clark-Wilson Model

Non-interference Model

Brewer and Nash - Chinese Wall

Take-Grant Model

Trusted Computer System Evaluation Criteria

(TCSEC)

TCSEC Rating Breakdown

Evaluation Criteria - ITSEC

ITSEC Ratings

ITSEC - Good and Bad

Common Criteria

Common Criteria Components

First Set of Requirements

Second Set of Requirements

Package Ratings

Common Criteria Outline

Certification vs. Accreditation

Module 6 - Operations Security

Operations Issues

Role of Operations

Administrator Access

Computer Operations – Systems Administrators

Security Administrator

Operational Assurance

Audit and Compliance

Some Threats to Computer Operations

Specific Operations Tasks

Product Implementation Concerns

Logs and Monitoring

Records Management

Change Control

Resource Protection

Major Components of Kerberos **Kerberos Authentication Steps**

Why Go Through All of this Trouble?

Issues Pertaining to Kerberos

SESAME as a Single Sign-on Technology

Federated Authentication

Agenda

IDS

Network IDS Sensors

Types of IDSs

Behavior-Based IDS

IDS Response Mechanisms

IDS Issues

Trapping an Intruder

Module 4 - Access Control

Role of Access Control

Definitions

More Definitions

Layers of Access Control

Layers of Access Controls

Access Control Mechanism Examples

Access Control Characteristics

Preventive Control Types

Control Combinations

Administrative Controls

Controlling Access

Other Ways of Controlling Access

Technical Access Controls

Physical Access Controls

Accountability

Information Classification

Information Classification Criteria

Declassifying Information

Types of Classification Levels

Models for Access

Discretionary Access Control Model

Enforcing a DAC Policy

Mandatory Access Control Model

MAC Enforcement Mechanism - Labels

Where Are They Used?

Role-Based Access Control (RBAC)

Acquiring Rights and Permissions

Rule-Based Access Control

Access Control Matrix

Access Control Administration

Access Control Methods

Remote Centralized Administration

RADIUS Characteristics

RADIUS

TACACS+ Characteristics

Diameter Characteristics

















CYBER SECURITY CERTIFICATIONS

Contingency Planning

System Controls

Trusted Recovery

Fault-Tolerance Mechanisms

Duplexing, Mirroring, Check Pointing

Redundant Array of Independent Disks (RAID)

Fault Tolerance

Redundancy Mechanism

Backups

Backup Types

Remote Access

Facsimile Security

Email Security

Before Carrying Out Vulnerability Testing

Vulnerability Assessments

Methodology

Penetration Testing

Penetration Testing

Hack and Attack Strategies

Protection Mechanism - Honeypot

Threats to Operations

Data Leakage - Social Engineering

Data Leakage – Object Reuse

Object Reuse

Why Not Just Delete File or Format the Disk?

Data Leakage - Keystroke Logging

Data Leakage - Emanation

Controlling Data Leakage - TEMPEST

Controlling Data Leakage - Control Zone

Controlling Data Leakage - White Noise

Summary

Module 7 - Symmetric Cryptography and Hashing

Cryptography Objectives

Cryptographic Definitions

A Few More Definitions

Need Some More Definitions?

Symmetric Cryptography – Use of Secret Keys

Cryptography Uses Yesterday and Today

Historical Uses of Symmetric Cryptography

Historical Uses of Symmetric Cryptography – Scytale

Cipher

Historical Uses of Symmetric Cryptography:

Substitution Cipher

Caesar Cipher Example

Historical Uses of Symmetric Cryptography: Vigenere

Cipher

Polyalphabetic Substitution

Vigenere Table Example

Example Continued

Historical Uses of Symmetric Cryptography: Enigma

Machine

Historical Uses of Symmetric Cryptography: Vernam

Cipher

Historical Uses of Symmetric Cryptography: Running

Key and Concealment

One-Time Pad Characteristics

Binary Mathematical Function

Key and Algorithm Relationship

Why Does a 128-Bit Key Provide More Protection than

a 64-Bit Kev?

Ways of Breaking Cryptosystems - Brute Force

Ways of Breaking Cryptosystems – Frequency

Analysis

Determining Strength in a Cryptosystem

Characteristics of Strong Algorithms

Open or Closed More Secure?

Types of Ciphers Used Today

Encryption/Decryption Methods

Type of Symmetric Cipher – Block Cipher

S-Boxes Used in Block Ciphers

Type of Symmetric Cipher – Stream Cipher

Encryption Process

Symmetric Characteristics

Sender and Receiver Must Generate the Same

Keystream

They both must have the same key and IV

Strength of a Stream Cipher

Let's Dive in Deeper

Symmetric Key Cryptography

Symmetric Key Management Issue

Symmetric Algorithm Examples

Symmetric Downfalls

Secret Versus Session Keys

Symmetric Ciphers We Will Dive Into

Symmetric Algorithms - DES

Evolution of DES

Block Cipher Modes - CBC

Different Modes of Block Ciphers - ECB

Block Cipher Modes - CFB and OFB

CFB and OFB Modes

Symmetric Cipher – AES

Other Symmetric Algorithms

Hashing Algorithms

Protecting the Integrity of Data

Data Integrity Mechanisms

Weakness in Using Only Hash Algorithms

More Protection in Data Integrity

MAC - Sender

MAC - Receiver

Security Issues in Hashing

Birthday Attack

Example of a Birthday Attack



















Module 8 - Asymmetric Cryptography and PKI

Asymmetric Cryptography

Public Key Cryptography Advantages

Asymmetric Algorithm Disadvantages

Symmetric versus Asymmetric

Asymmetric

Asymmetric Algorithm – Diffie-Hellman

Asymmetric Algorithm - RSA

Asymmetric Algorithms – El Gamal and ECC

Example of Hybrid Cryptography

When to Use Which Key

Using the Algorithm Types Together

Digital Signatures

Digital Signature and MAC Comparison

What if You Need All of the Services?

U.S. Government Standard

Why Do We Need a PKI?

PKI and Its Components

CA and RA Roles

Let's Walk Through an Example

Digital Certificates

What Do You Do with a Certificate?

Components of PKI – Repository and CRLs

Steganography

Key Management

Link versus End-to-End Encryption

End-to-End Encryption

E-mail Standards

Encrypted message

Secure Protocols

SSL and the OSI Model

SSL Hybrid Encryption

SSL Connection Setup

Secure E-mail Standard

SSH Security Protocol

Network Layer Protection

IPSec Key Management

Key Issues Within IPSec

IPSec Handshaking Process

SAs in Use

IPSec Is a Suite of Protocols

IPSec Modes of Operation

IPsec Modes of Operation

Attacks on Cryptosystems

More Attacks

Module 9 - Network Connections

Network Topologies- Physical Layer

Topology Type - Bus

Topology Type - Ring

Topology Type – Star

Network Topologies - Mesh

Summary of Topologies

LAN Media Access Technologies

One Goal of Media Access Technologies

Transmission Types – Analog and Digital

Transmission Types - Synchronous and

Asynchronous

Transmission Types – Baseband and Broadband

Two Types of Carrier Sense Multiple Access

Transmission Types- Number of Receivers

Media Access Technologies - Ethernet

Media Access Technologies - Token Passing

Media Access Technologies - Polling

Cabling

Signal and Cable Issues

Cabling Types - Coaxial

Cabling Types – Twisted Pair

Types of Cabling - Fiber

Cabling Issues - Plenum-Rated

Types of Networks

Network Technologies

Network Technologies

Network Configurations

MAN Technologies - SONET

Wide Area Network Technologies

WAN Technologies Are Circuit or Packet Switched

WAN Technologies - ISDN

ISDN Service Types

WAN Technologies - DSL

WAN Technologies- Cable Modem

WAN Technologies-Packet Switched

WAN Technologies - X.25

WAN Technologies - Frame Relay

WAN Technologies - ATM

Multiplexing

Module 10 - Network Protocols and Devices

OSI Model

An Older Model

Data Encapsulation

OSI – Application Layer

OSI – Presentation Layer

OSI - Session Layer

Transport Layer

OSI - Network Layer

OSI - Data Link

OSI - Physical Layer

Protocols at Each Layer

Devices Work at Different Layers

Networking Devices

Repeater

Hub

Bridge

Switch

Virtual LAN



















Router

Gateway

Bastion Host

Firewalls

Firewall - First line of defense

Firewall Types - Packet Filtering

Firewall Types - Proxy Firewalls

Firewall Types - Circuit-Level Proxy Firewall

Type of Circuit- Level Proxy - SOCKS

Firewall Types – Application-Layer Proxy

Firewall Types - Stateful

Firewall Types – Dynamic Packet-Filtering

Firewall Types - Kernel Proxies

Firewall Placement

Firewall Architecture Types – Screened Host

Firewall Architecture Types - Multi- or Dual-Homed

Firewall Architecture Types – Screened Subnet

IDS - Second line of defense

IPS - Last line of defense?

HIPS

Unified Threat Management

UMT Product Criteria

Protocols

TCP/IP Suite

Port and Protocol

Relationship

Conceptual Use of Ports

UDP versus TCP

Protocols - ARP

Protocols - ICMP

Protocols - SNMP

Protocols - SMTP

Protocols - FTP, TFTP, Telnet

Protocols - RARP and BootP

Network Service - DNS

Network Service - NAT

Module 11 - Telephony, VPNs and Wireless

PSTN

Remote Access

Dial-Up Protocols and Authentication

Protocols

Dial-Up Protocol - SLIP

Dial-Up Protocol - PPP

Authentication Protocols – PAP and CHAP

Authentication Protocol - EAP

Voice Over IP

Private Branch Exchange

PBX Vulnerabilities

PBX Best Practices

Virtual Private

Network Technologies

What Is a Tunnelling Protocol?

Tunnelling Protocols - PPTP

Tunnelling Protocols - L2TP

Tunnelling Protocols – IPSec

IPSec - Network Layer Protection

IPSec

IPSec

SSL/TLS

Wireless Technologies- Access Point

Standards Comparison

Wireless Network Topologies

Wi-Fi Network Types

Wireless Technologies - Access Point

Wireless Technologies - Service Set ID

Wireless Technologies - Authenticating to an AP

Wireless Technologies - WEP

WEP

Wireless Technologies -

More WEP Woes

Weak IV Packets

More WEP Weaknesses

How WPA Improves on WEP

How WPA Improves on WEP

TKIP

The WPA MIC Vulnerability

802.11i - WPA2

WPA and WPA2 Mode Types

WPA-PSK Encryption

Wireless Technologies - WAP

Wireless Technologies - WTLS

Wireless Technologies - Common Attacks

Wireless Technologies - War Driving

Kismet

Wireless Technologies – Countermeasures

Network Based Attacks

ARP Attack

DDoS Issues

Man-in-the Middle

Traceroute Operation

Module 12 - Security Architecture and Attacks

ESA Definition...

What is Architecture?

Architecture Components

Key Architecture Concepts - Plan

Objectives of Security Architecture

Technology Domain Modeling

Integrated Security is Designed Security

Security by Design

Architectural Models

Virtual Machines

Cloud Computing

Memory Types

Virtual Memory



















Memory Management

Accessing Memory Securely

Different States that Processes Work In

System Functionality

Types of Compromises

Disclosing Data in an Unauthorized Manner

Circumventing Access Controls

Attacks

Attack Type – Race Condition

Attack Type - Data Validation

Attacking Through Applications

How Buffers and Stacks Are Supposed to Work

How a Buffer Overflow Works

Attack Characteristics

Attack Types

More Attacks

Host Name Resolution Attacks

More Attacks (2)

Watching Network Traffic

Traffic Analysis

Cell Phone Cloning

Illegal Activities

Module 13 - Software Development Security

How Did We Get Here?

Device vs. Software Security

Why Are We Not Improving at a Higher Rate?

Usual Trend of Dealing with Security

Where to Implement Security

The Objective

Security of Embedded Systems

Development Methodologies

Maturity Models

Security Issues

OWASP Top Ten (2011)

Modularity of Objects

Object-Oriented Programming Characteristic

Module Characteristics

Linking Through COM

Mobile Code with Active Content

World Wide Web OLE

ActiveX Security

Java and Applets

Common Gateway Interface

How CGI Scripts Work

Cookies

PCI Requirements

Virtualization - Type 1

Virtualization – Type 2

Module 14 - Database Security and System

Development

Database Model

Database Models - Hierarchical Database Models - Distributed

Database Models - Relational

Database Systems

Database Models - Relational Components

Foreign Key

Database Component

Database Security Mechanisms

Database Data Integrity Controls

Add-On Security

Database Security Issues

Controlling Access

Database Integrity

Data Warehousing

Data Mining

Artificial Intelligence

Expert System Components

Artificial Neural Networks

Software Development Models

Project Development - Phases III, IV, and V

Project Development-Phases VI and VII

Verification versus Validation

Evaluating the Resulting Product

Controlling How Changes Take Place

Change Control Process

Administrative Controls

Malware

Virus

More Malware

Rootkits and Backdoors

DDoS Attack Types

Escalation of Privilege

Protect against privilege escalation

DDoS Issues

DDoS

Buffer Overflow Definition

Overflow Illustration

Mail Bombing

E-Mail Links

Phishing

Spear Phishing

Replay Attack

Cross-Site Scripting Attack

Timing Attacks

More Advanced Attacks

Summary

Module 15 - Malware and Software

Attacks

Malware

Virus

More Malware

Rootkits and Backdoors

















CYBER SECURITY CERTIFICATIONS

DDoS Attack Types Escalation of Privilege

DDoS Issues

DDoS

Buffer Overflow Definition

Overflow Illustration

Buffer Overflows

Mail Bombing

E-Mail Links

Phishing

Spear Phishing

Replay Attack

Cross-Site Scripting Attack

Timing Attacks

More Advanced Attacks

Summary

Module 16 - Business Continuity

Phases of Plan

Who Is Ready?

Pieces of the BCP

BCP Development

Where Do We Start?

Why Is BCP a Hard Sell to Management?

Understanding the Organization

Critical products and services

Dependencies

Supply chain

Between departments

Personnel

Information

Equipment

Facilities

BCP Committee

BCP Risk Analysis

Identify Vulnerabilities and Threats

Categories

How to Identify the Most Critical Company Functions

Loss Criteria

Interdependencies

Identifying Functions' Resources

How Long Can the Company Be Without These

Resources?

Calculating MTD

Recovery Point Objective

Calculation of maximum data loss

Determines backup strategy

Defines the most current state of data upon recovery

Recovery Strategies

Based on the results of the BIA

May be different for each department

Must be less than MTD

Sets the RTO

What Items Need to Be Considered in a Recovery?

Facility Backups - Hot Site

Facility Backups - Warm Site

Facility Backups - Cold Site

Compatibility Issues with Offsite Facility

Which Do We Use?

Choosing Offsite Services

Subscription Costs

Choosing Site Location

Other Offsite Approaches

BCP Plans Commonly and Quickly Become Out of

Date

Summary

Module 17 - Disaster Recovery

Proper Planning

Executive Succession Planning

Preventing a Disaster

Preventive Measures

Backup/Redundancy Options

Disk Shadowing

Backing Up Over Telecommunication

Serial Lines

HSM

SAN

Co-Location

Other Options

Review - Results from the BIA

Review - Results from

Recovery Strategy

Now What?

Priorities

Plan Objectives

Defining Roles

The Plan

Recovery

Return to Normal Operations

Environment

Operational Planning

Emergency Response

Reviewing Insurance

When Is the Danger Over?

Now What?

Testing and Drills

Types of Tests to Choose From

What Is Success?

Summary

Module 18 - Incident Management, Law, and Ethics

Seriousness of Computer Crimes Incidents



















Incident Management Priorities

Incident Response Capability

Incident Management Requires

Preparing for a Crime Before It Happens

Incident Response Phases

Types of Law

Foundational Concepts of Law

Common Laws - Criminal

Common Laws - Civil

Common Laws - Administrative

Intellectual Property Laws

More Intellectual Property Laws

Software Licensing

Digital Millennium Copyright Act

Historic Examples of Computer Crimes

Who Perpetrates These Crimes?

The Evolving Threat

Types of Motivation for Attacks

A Few Attack Types

Telephone Fraud

Identification Protection & Prosecution

Computer Crime and Its Barriers

Countries Working Together

Security Principles for International Use

Determine if a Crime Has Indeed Been Committed

When Should Law Enforcement Get Involved?

Citizen versus Law Enforcement Investigation

Investigation of Any Crime

Role of Evidence in a Trial

General Rules for Evidence

Evidence Requirements

Evidence Collection Topics

Chain of Custody

How Is Evidence Processed?

Evidence Types

Hearsay Rule Exception

Privacy of Sensitive Data

Privacy Issues – U.S. Laws as Examples

European Union Principles on Privacy

Routing Data Through Different Countries

Employee Privacy Issues

Computer Forensics

Trying to Trap the Bad Guy

Companies Can Be Found Liable

Sets of Ethics

Ethics - mile2

Ethics - Computer Ethics Institute

Ethics - Internet Architecture Board

GAISP- Generally Accepted Information Security

Principles

Module 19 - Physical Security

Physical Security - Threats

Different Types of Threats & Planning

Facility Site Selection

Facility Construction

Devices Will Fail

Controlling Access

Possible Threats

External Boundary Protection

Lock Types

Facility Access

Piggybacking

Securing Mobile Devices

Entrance Protection

Perimeter Protection - Fencing

Perimeter Protection - Lighting

Perimeter Security – Security Guards

Surveillance/Monitoring

Types of Physical IDS

Electro-Mechanical Sensors

Volumetric Sensors

Facility Attributes

Electrical Power

Problems with Steady Power Current

Power Interference

Power Preventive Measures

Environmental Considerations

Fire Prevention

Automatic Detector Mechanisms

Fire Detection

Fire Types

Suppression Methods

Fire Extinguishers

Fire Suppression

Fire Extinguishers













