CIW Program Catalog

August 2001 – March 2002

CIWPC105

CIW Internet Skills Certification Program

The CIW Internet skills certification program is aimed at professionals who design, develop, administer, secure and support Internet- or intranet-related services. It offers a unique opportunity to learn, demonstrate and prove competence on Web-related technologies. All CIW certifications are endorsed by the International Webmasters Association (IWA) and the Association of Internet Professionals (AIP).

Benefits of Certification

CIW Internet skills certification offers industry-wide recognition of an individual's Internet and Web knowledge and skills, and is frequently a factor in hiring and assignment decisions. It also provides tangible evidence of a person's competency as an Internet professional. Holders of this certification can demonstrate to potential employers and clients that they have passed rigorous training and examination requirements that set them apart from non-certified competitors. The CIW logo identifies your status as a professional who has been certified by one of the most prestigious programs in the industry.

Certification Testing

CIW certification exams are administered by Prometric, Inc. through Authorized Prometric Testing Centers (APTCs) and by Virtual University Enterprises (VUE) testing centers worldwide. The exams measure technical proficiency and establish a level of core competency required to become a CIW. Call Prometric, Inc. at 1-800-380-EXAM to schedule any CIW exam, and 1-877-803-6867 to schedule the CompTIA i-Net+ exam. Or visit *www.vue.com* to schedule any CIW exam through a VUE testing center.

We encourage you to speak with the CIW training partner of your choice to find out more about the vendor-neutral CIW Internet Skills program. To locate a CIW training partner, visit www.CIWcertified.com, select Training and then follow the links to select the training partner of your choice.

PROVIDING THE UNIVERSAL STANDARD IN WEB CERTIFICATION

IWA, the non-profit association for Web professionals, is the industry's recognized leader in providing educational and certification standards. IWA initiatives support more than 100 official chapters with 24,000 individual members in 106 countries.

IWA has integrated industry-leading CIW Internet skills training into its Certified Web Professional program to provide the **universal standard** in Web certification. To be eligible for IWA Certified Web Professional status, a candidate must pass CIW Foundations and a CIW job role series exam, demonstrate a minimum of two years related experience, and job role series every three years by completing thirty hours of continuing education.

IWA Certified Web Professional (CWP) status provides Web certification based on an individual's proven experience, professionalism, and knowledge. By following the IWA CWP career path, Web professionals can increase their potential for financial reward, employment opportunities, and rapid career advancement.

www.iwanet.org

Table of Contents

Why CIW Certification?

Certification establishes and validates critical job skills for Internet professionals. CIW certification establishes an individual as an expert in vendor-neutral Internet technologies. Like a professional license, the CIW designation offers structured, reliable evidence of Internet skills competency. CIW certification exams are built on rigorous and standardized criteria. Benefits of CIW certification include:

- Objective validation of critical Internet skills.
- Verification tool for employers to distinguish among candidates for hiring and promotion.
- Worldwide credential for employees attesting to their mastery of important skills.

Vendor-Neutrality

CIW courseware, certification and services are based on vendor-neutral concepts and objectives as defined by the Association of Internet Professionals (AIP), and as mandated by industry trends and best practices. In CIW courseware, vendor-neutral objectives are transferred into easy-to-follow narrative text, hands-on labs, exercises, and case studies that include the most popular and cost-effective products available. The presence of vendor products in our courseware is always driven by our expertise in mapping vendor-neutral industry-standard objectives to specific vendors' products.

CIW Endorsements

CIW is recognized as a leading industry standard by several independent Web professional associations and organizations. The CIW credential is:

- Recognized by the Association of Internet Professionals (AIP) – www.association.org and www.accredit.net.
- Endorsed by the International Webmasters Association (IWA) – www.iwanet.org.

Official CIW Curriculum

All official CIW curriculum is identified with the Official CIW Curriculum seal. Curriculum bearing this logo contains learning objectives, course architecture, narrative and exercises that meet the CIW standard of vendor-neutral Internet training.

Approved CIW Curriculum

CIW approved content is identified with the Approved CIW Content seal used on CIW courseware that is “authorized” but not produced by CIW. The presence of this seal means the CIW courseware being used maps to CIW objectives and is an approved method (though we recommend several methods of study) to helps candidates prepare for CIW exams.

CIW Certifications and Paths

The first step toward CIW certification is the CIW Foundations series. After passing the Foundations exam, students become a CIW Associate and can choose from three Master CIW certification tracks. CIW Associates who pass any one CIW job role series becomes a CIW Professional. CIW Professionals who pass all of the certification exams in a specific Master CIW track earn Master CIW Administrator, Master CIW Designer, or Master CIW Enterprise Developer designation.

CIW Associate Designation

CIW Foundations is a prerequisite for all CIW series. To become a CIW Associate, students must pass the CIW Foundations exam (1D0-410) administered by Prometric or VUE. CIW accepts score reports from students who have passed the entry-level i-Net+ exam and will award CIW Foundations certification and the CIW Associate designation to these individuals. For more information, contact us at exam@ciwcertified.com.

CIW Professional Designation

CIW Associates can earn CIW Professional designation by passing any CIW job role series exam. Students who have passed multiple CIW series exams are still considered a CIW Professional until they pass the required exams for Master CIW certification. Most CIW Professionals seek Master CIW certification and are in the process of passing the required series exams necessary to become a Master CIW Administrator, a Master CIW Enterprise Developer, or a Master CIW Designer.

Master CIW Certification

To become Master CIW certified, it is recommended that students take each training series in sequence. For example, to achieve Master CIW Administrator certification, it is recommended that students receive training in CIW Server Administrator curriculum, then CIW Internetworking Professional curriculum, and then CIW Security Professional curriculum.

It is also recommended, but not required, that students pass each CIW series exam before sitting the next CIW series training. This strategy allows them to focus on the technology for each CIW series before adding more complex technologies.

After passing all of the series exams in a Master CIW track, students will receive their Master CIW certificate.

Master CIW Web Site Manager

Master CIW Web Site Manager is our newest Master CIW track, composed of two Internet job role series exams (Site Designer and Server Administrator) and two additional language exams (JavaScript and Perl Fundamentals from our Web Languages series).

Master CIW Administrator

Master CIW Administrator is composed of three five-day series, each series representing an Internet job role with its own exam (Server Administrator, Internetworking Professional, and Security Professional series).

i-Accelerate

i-Accelerate is a fast track for becoming Master CIW Administrator status in less time than the standard program length. Microsoft Certified Systems Engineers (MCSEs), Certified Novell Engineers (CNEs), and Intel certified candidates now have the ability to bypass two of the original four exams required for the Master CIW Administrator certification. For more information, visit: www.ciwcertified.com/iAccelerate/iAccelerate.asp?comm=home&llm=1.

Master CIW Enterprise Developer

Master CIW Enterprise Developer is our most comprehensive program, composed of three Internet job role series (Application Developer, Database Specialist, and Enterprise Specialist) and three additional language/theory series (Web Languages, Java Programming, and Object-Oriented Analysis).

Master CIW Designer

Master CIW Designer is composed of two five-day series, each series representing an Internet job role with its own exam (Site Designer and E-Commerce Designer series).

CIW Curricula

CIW is a comprehensive program that offers training and certification for all Internet professionals. The following table lists the courses that compose each Master CIW certification and CIW job role series.

Master CIW Tracks	CIW Job Role and Language/Theory Series	Course Titles
	CIW Foundations Series *(CIW job role – 30 hours)*	• Internet Fundamentals • Web Page Authoring Fundamentals • Networking Fundamentals
Master CIW Web Site Manager	CIW Server Administrator Series *(CIW job role – 30 hours)*	• Internet System Management • Advanced Internet System Management
	Web Languages *(Language series – 30 hours)*	• JavaScript Fundamentals • Perl Fundamentals
	CIW Site Designer Series *(CIW job role – 30 hours)*	• Design Methodology and Technology
Master CIW Administrator	CIW Server Administrator Series *(CIW job role – 30 hours)*	• Internet System Management • Advanced Internet System Management
	CIW Internetworking Professional Series *(CIW job role – 30 hours)*	• TCP/IP Internetworking • Advanced TCP/IP Concepts and Practices
	CIW Security Professional Series *(CIW job role – 30 hours)*	• Network Security and Firewalls • Operating Systems Security • Security Auditing, Attacks, and Threat Analysis
Master CIW Enterprise Developer*	Web Languages *(Language series – 30 hours)*	• JavaScript Fundamentals • Perl Fundamentals
	CIW Application Developer Series *(CIW job role – 30 hours)*	• Fundamentals of CGI Using Perl • Dynamic Server Pages
	Java Programming *(Language series – 30 hours, plus additional 18-hour exam preparation course)*	• Java Programming Fundamentals • Sun Certified Java Programmer Exam Preparation Guide (*recommended but note required*)
	OO Analysis and Design *(Theory series – 30 hours)*	• Object-Oriented Analysis and Design
	Database Specialist *(CIW job role – 30 hours)*	• Database Design and Methodology • Building Database Client Applications Using JDBC 2.0
	Enterprise Specialist *(CIW job role – 30 hours)*	• Distributed Object Computing Using CORBA and Java • Enterprise Java Beans
Master CIW Designer	CIW Site Designer Series *(CIW job role – 30 hours)*	• Design Methodology and Technology
	CIW E-Commerce Designer Series *(CIW job role – 30 hours)*	• E-Commerce Strategies and Practices

CIW Foundations/i-Net+ Certification

The CIW Foundations certified individual has the basic hands-on skills and knowledge that an Internet professional is expected to understand and use. Foundations skills include basic knowledge of Internet technologies, network infrastructure, and Web authoring using HTML.

Foundations / i-Net+
5-day series
CIW Exam 1D0-410 and/or i-Net+ Exam IK0-001

Target Audience	All professionals who use the Internet. Information in this course is required for all levels of specialization in the CIW program.
Job Responsibilities	Understand the common core of Internet knowledge, and apply the foundation skills required for further specialization.
Prerequisites	No experience using the Internet is necessary. An understanding of Microsoft Windows is required.
Training/ Experience	Students should take the following courses (or have equivalent experience) before taking the CIW Foundations exam: • **Internet Fundamentals** (6 hours) • **Web Page Authoring Fundamentals** (12 hours) • **Networking Fundamentals** (12 hours)
Certification Awards	To become Foundations certified, students must pass the CIW Foundations exam 1D0-410 administered by Prometric, Inc. and VUE. To become i-Net+ certified, students must pass i-Net+ exam IK0-001 administered by Prometric, Inc. or VUE. CIW accepts score reports from students who have passed the entry-level i-Net+ exam and will award Foundations certification to these individuals. For more information, contact us at exam@CIWcertified.com. To earn CIW Professional designation, students must pass CIW Foundations 1D0-410 and any CIW job role series exam.

CIW Foundations Series - Course 1:

Internet Fundamentals

Internet Fundamentals is a one-day course designed to guide students through the Internet and its wide array of useful resources. Students learn how to use key Internet technologies, such as Web browsers, e-mail, newsgroups, File Transfer Protocol (FTP), Telnet, and search engines. Students gain experience configuring both Netscape Navigator and Microsoft Internet Explorer to access rich multimedia, including RealPlayer, Shockwave and Flash content. Students also use a variety of Web-based search engines to conduct advanced searches and learn the basics of electronic commerce and security issues.

Topics

Overview of the Internet
The Internet
Evolution of the Internet
How the Internet Works
Client/Server Model on the Internet
Connecting to the Internet
Internet Protocols
Domain Name System (DNS)
The Business of Domain Names
Uniform Resource Locators (URLs)
Intranets and Extranets

Browsing the World Wide Web
Web Browsers and the Internet
Evolution of the World Wide Web
Technical Issues
Introducing the Web Browser
Viewing a Web Page with Netscape Navigator
Viewing a Web Page with Microsoft Internet Explorer
Customizing Your Browser
Fonts
Home Page
History Folder
Browser Cache
Bookmarks and Favorites
Image Loading
Wireless Application Protocol (WAP)

FTP, Newsgroups, and Telnet
Additional Internet Resource Tools
File Transfer Protocol (FTP)
Newsgroup Articles
Telnet

Electronic Mail
Electronic Mail (E-Mail)
E-mail Address Format
Sending and Receiving E-mail
Netscape Messenger E-mail Basics
Outlook Express E-mail Basics
Netiquette
E-mail Signatures and Privacy
E-mail Attachments
Mailing Lists

Objects, Plug-ins, and Viewers
Multimedia on the Web
Objects and Active Content
C, C++, Java, Java Applets, JavaScript, Jscript, ActiveX, and Visual Basic Script (VBScript)
Objects and Security Issues
Introduction to Plug-in Technology
Plug-in Installation
Types of Browser Plug-ins
Viewers
Miscellaneous File Formats

Search Engines
Introduction to Search Engines
Adding a Web Site to a Search Engine
Search Indexes
Basic and Advanced Search Techniques
Boolean Operators
Searching for Graphics, "People" Information, Mailing Lists, and Newsgroups
Pre-Web Search Tools

Security
Internet Security
Cookies
Sending Secure Data over the Web
Authentication
Digital Certificates
Configuring Browser Security
Encryption
Viruses
Proxy Servers
Firewalls

E-Commerce
Electronic Commerce (E-Commerce)
Definition of Electronic Commerce Definition
Electronic vs. Traditional Commerce
Types of Electronic Commerce
Electronic Data Interchange (EDI)
Secure Electronic Transactions (SET)
Advantages of Electronic Commerce
Issues in Electronic Commerce
Copyrights, Licensing and Trademarks
E-Commerce Solutions
Project Management Fundamentals

Target Audience

All professionals required to use the Internet in their daily job functions. Information in this course is required for all levels of specialization in the CIW program.

Job Responsibilities

Understand the common core of Internet knowledge, and apply the foundation skills required for further specialization.

Prerequisites

No experience using the Internet is necessary. An understanding of Microsoft Windows 95/98/Me is required.

Duration

6 hours

CIW Foundations Series - Course 2:

Web Page Authoring Fundamentals

Web Page Authoring Fundamentals is a two-day course designed to teach students Web page creation and other aspects of Web authoring. Students gain experience developing Web pages in a text editor and a graphical user interface (GUI) editor. Students also learn how to use Cascading Style Sheets (CSS) and study the basics of Extensible Hypertext Markup Language (XHTML), JavaScript, Dynamic HTML (DHTML), and the Document Object Model (DOM). After completing this course, students will be able to create simple Web pages containing text, graphics, hyperlinks, tables, forms and frames.

Topics

Intro to Web Page Authoring
Creating Web Pages
Text Editors
Graphic User Interface (GUI) Editors
Web Page Accessibility
Front-End Issues
Back-End Issues

Hypertext Markup Language (HTML)
What Is HTML?
HTML Standards
Extensible Hypertext Markup Language (XHTML)
Web browsers and Standards

HTML Coding
Creating an HTML Page
Markup Tags
Document Structure Tags
Paragraph Formatting and Block-level Elements
Text-level Elements
Lists
Adding Hidden Comments
Good Coding Practice

HTML Horizontal Rules and Graphical Elements
Adding Horizontal Ruling Lines
Incorporating Images Into Pages
Special Characters
Specifying Colors in HTML
The Web-Safe Color Palette
Page Colors and Backgrounds
Specifying Font Information

HTML Hyperlinks
Understanding Links
Anchor Tag
Using Images as Links
Creating Internal Links

HTML Tables
Introduction to Tables
Table and Data Alignment Options
Changing Height and Width of Table Elements
Column and Row Spanning

Forms
Forms Overview
<FORM> Tag
Web Form Fields

HTML Image Techniques
Image Techniques
Image Maps
Defining a Client-side Image Map
Image Transparency
Interlacing
Animated GIFs

HTML Frames
Introduction to Frames
<FRAMESET> and <FRAME> Tag
Frameset Document
<NOFRAMES> Tag
Targeting Frames with Hyperlinks
Specifying a Base Target
Borderless Frames

Graphical User Interface HTML Editors
Graphical User Interface Editors
Types of HTML GUI Editors
GUI Editor Functionality
Creating Web Pages in a GUI Editor
HTML Text Editors vs. GUI Editors

HTML Extensions
Extending HTML
Cascading Style Sheets (CSS)
JavaScript
Dynamic HTML (DHTML)
Document Object Model (DOM)
Extensible HTML (XHTML)
Extensible Markup Language (XML)

Target Audience

All professionals required to use the Internet in their daily job functions. Information in this course is required for all levels of specialization in the CIW program.

Job Responsibilities

Understand the common core of Internet knowledge, and apply the foundation skills required for further specialization.

Prerequisites

Students must have completed *Internet Fundamentals* or have equivalent Internet knowledge.

Duration

12 hours

CIW Foundations Series - Course 3:

Networking Fundamentals

Networking Fundamentals is a two-day class designed to teach students fundamental networking concepts and practices. Topics include network architecture and standards, networking protocols, TCP/IP, Internet servers, server-side scripting and database connectivity, and security.

Topics

Introduction to Networking
Networks Defined
Networking Evolution
Mainframes
Client/Server Model
Web-based Networking
Networking Categories
Network Topologies
Network Operating Systems
Novell NetWare
Microsoft Windows NT/2000
UNIX

Networking Protocols
The Need for Protocols
OSI Reference Model
Packets
OSI/RM Protocol Examples
Major Networking Protocols: TCP/IP, IPX/SPX, NetBEUI, and AppleTalk, Data Link Control (DLC), Systems Network Architecture (SNA)
Choosing and Combining Protocols

LANs and WANs
Basics of LANs and WANs
Local Area Networks (LANs)
Wide Area Networks (WANs)
Network Access Points (NAPs)
Common Network Components
Transmission Media and Types
IEEE LAN Standards
Additional LAN Standards
WAN Standards
T-Carrier and E-Carrier Systems

TCP/IP Architecture and Internet Addressing
Introduction to TCP/IP
Internet Architecture
Requests for Comments (RFCs)
Internet Protocols
Demultiplexing
Introduction to Routing
Routing Protocols
Port Numbers
Internet Addressing
Internet Address Classes
IP Addressing Rules
Reserved IP Addressing
Subnet Masks
Normal TCP/IP Desktop Configurations
Diagnostic Tools for Internet Troubleshooting

Internetworking Servers
The Role of Servers
Internetworking Servers
File and Print Servers
HTTP Server Essentials
Proxy, Caching, Mail, Mailing List, Media, DNS, FTP, News, Certificate, Directory, Catalog, and Transaction Servers
The Internet Daemon: inetd
Mirrored Servers
Choosing the Ideal Server
Popular Server Products

Server-side Scripting and Database Connectivity
Introduction to Scripting
Client-side and Server-side Scripting
HTTP Gateways
HTML Forms and Form Processing
Common Gateway Interface (CGI)
CGI Alternatives: Server Programming Interfaces, Scripting Technologies, and Java Servlets
Databases, Database Connectivity, and Connectivity Implementations

Network Security Essentials
Reasons for Security
Defining Security and Assets
Security Threats and Attacks
Viruses and the Hacker Process
Defeating Attacks
Auditing
Intrusion-Detection Software
Authentication
Encryption
Country-Specific Encryption Standards
Network-level Protocols and Encryption
Virtual Private Networks (VPN)
Secure Sockets Layer (SSL)
Digital Certificates
Firewalls, Packet Filters, Proxy Servers, and Firewall Topology
Firewall Summary

Target Audience

All professionals required to use the Internet in their daily job functions. Information in this course is required for all levels of specialization in the CIW program.

Job Responsibilities

Understand the common core of Internet knowledge, and apply the foundation skills required for further specialization.

Prerequisites

Students must have completed *Internet Fundamentals* and *Web Page Authoring Fundamentals* or have equivalent Internet knowledge.

Duration

12 hours

Master CIW Certification Tracks

After becoming a CIW Associate (CIW Foundations certified) and a CIW Professional (CIW Foundations certificate plus a passing score an any CIW job-role series) students can become Master CIW certified. Detailed outlines for the CIW series (and courses within a series) for each Master CIW track follow this section. Below is a brief summary of the four Master CIW certification tracks and their respective CIW series and exams.

Master CIW Web Site Manager

Foundations Certified		CIWv4 exam 1D0-410
Master CIW Web Site Manager	**CIW Series**	**CIW Series Exam**
	CIW Server Administrator Series (30 hours)	CIWv4 exam 1D0-450
	Web Languages Series (30 hours)	CIWv4 exam 1D0-435 – *JavaScript* CIWv4 exam 1D0-437 – *Perl*
	CIW Site Designer Series (30 hours)	CIWv4 exam 1D0-420

Master CIW Administrator

Foundations Certified		CIWv4 exam 1D0-410
Master CIW Administrator Certification	**CIW Series**	**CIW Series Exam**
	CIW Server Administrator Series (30 hours)	CIWv4 exam 1D0-450
	CIW Internetworking Professional Series (30 hours)	CIWv4 exam 1D0-460
	CIW Security Professional Series (30 hours)	CIWv4 exam 1D0-470

Master CIW Enterprise Developer

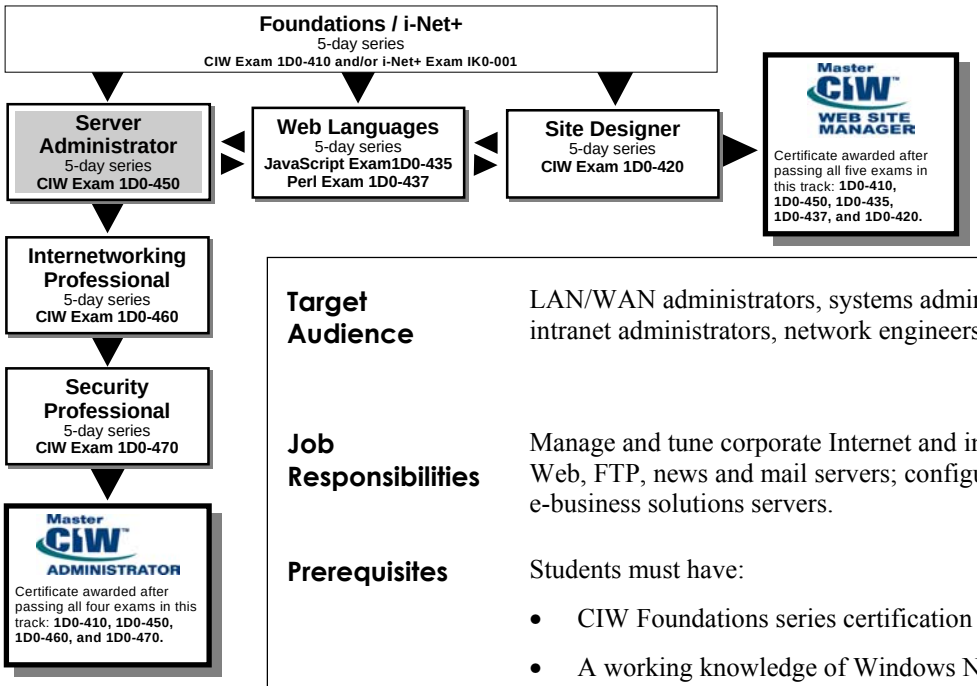
Foundations Certified		CIWv4 exam 1D0-410
Master CIW Enterprise Developer Certification	**CIW Series**	**CIW Series Exam**
	Web Languages Series (30 hours)	CIWv4 exam 1D0-435 – *JavaScript* CIWv4 exam 1D0-437 – *Perl*
	CIW Application Developer (30 hours)	CIWv4 exam 1D0-430
	Java Programming Fundamentals (30 hours) Sun Certified Java Programmer Exam Preparation Guide - *recommended but note required* (18 hours)	Sun's Certified Java Programmer exam
	OO Analysis and Design (30 hours)	CIWv4 exam 1D0-438
	CIW Database Specialist (30 hours)	CIWv4 exam 1D0-441
	CIW Enterprise Specialist (30 hours)	CIWv4 exam 1D0-441

Master CIW Designer

Foundations Certified		CIWv4 exam 1D0-410
Master CIW Designer Certification	**CIW Series**	**CIW Series Exam**
	CIW Site Designer Series (30 hours)	CIWv4 exam 1D0-420 – *available Sept 2000*
	CIW E-Commerce Designer Series (30 hours)	CIWv4 exam 1D0-425

Master CIW Administrator or Master CIW Web Site Manager and the Server Administrator Series

The CIW Server Administrator series is a requirement for Master CIW Web Site Manager and Master CIW Administrator certification. Server administrator manages and tunes corporate e-business solutions infrastructure including Web, FTP, news and mail servers for midsize to large businesses. Server administrators also configure, manage and deploy e-business solutions servers.



Target Audience

LAN/WAN administrators, systems administrators, systems managers, intranet administrators, network engineers, and internetworking engineers.

Job Responsibilities

Manage and tune corporate Internet and intranet infrastructure; monitor Web, FTP, news and mail servers; configure and deploy e-business solutions servers.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410), and
- A working knowledge of Windows NT administration including installation and configuration,

or equivalent experience for those students not seeking Master CIW Administrator or Master CIW Web Site Manager certification.

Training/ Experience

Students should take the following courses (or have equivalent experience) before taking the CIW Server Administrator 1D0-450 exam:

- **Internet System Management** (12 hours)
- **Advanced Internet System Management** (18 hours)

Certification Awards

To become Master CIW Administrator certified, students must pass the Foundations 1D0-410, Server Administrator 1D0-450, Internetworking Professional 1D0-460, and Security Professional 1D0-470 exams administered by Prometric, Inc. or VUE.

To become Master CIW Web Site Manager certified, students must pass the Foundations 1D0-410, Server Administrator 1D0-450, Web Languages 1D0-435 and 1D0-437, and Site Designer 1D0-420 exams administered by Prometric, Inc. or VUE.

CIW Server Administrator Series – Course 1:

Internet System Management

Internet System Management is a two-day class that teaches foundational Internet services. Students learn user management concepts in Windows 2000 and Linux, configure Domain Name System (DNS) services, and Microsoft WINS, Samba, Telnet, and FTP. Students also learn about choosing appropriate Internet system platforms and receive training on how to calculate throughput, choose appropriate Internet connections and configure Windows 2000 Server and Red Hat Linux to use TCP/IP. By the end of this course, students will be able to provide essential TCP/IP services for any business interested in establishing an effective e-commerce presence.

Topics

Systems and Services
Common IT Tasks and Services
System Configuration
User Management
System Performance
Maintenance and Backup

Internet System Installation and Configuration Issues
System Elements
Bandwidth
Calculating Throughput
Internetworking Operating Systems
Novell NetWare
Operating System Issues
Common System Vendors
Installing Systems

Configuring the System
Assigning IP Addresses
TCP/IP Configuration Parameters
Adapters
Static Addressing
Configuring Linux
Additional TCP/IP Issues and Commands

User Management Essentials
Authentication
Security Models and Authentication
Peer-level and User-level Access
Creating User Accounts
Universal Permissions
Windows NT, UNIX and Novell Permissions
Additional Logon Account Terms
Administrative Privilege
Standard Password Practices
Network Policies
Standard Operating Procedures

Managing Users in Windows 2000
Introduction to User Management
The Security Accounts Manager
The Computer Management Snap-in
Local Security Settings
Auditing, Ownership, and Rights
NTFS Permissions and Internet Users
Editing and Customizing User Accounts
Windows 2000 Services and User Accounts

Managing Users in Linux
Adding Accounts in Linux
Manually Adding Users
Linux User Accounts
Groups
Linux System Accounts

Name Resolution in the LAN with DNS
Domain Name System
Domain Name Space
Accessing Hosts by DNS Name
Setting up DNS
Probing DNS with Nslookup
Setting Up DNS in NT Server 4.0
Propagating Changes from the Primary Server to the Secondary Server
Changing the Boot Method Option in NT
Windows NT 2000 Server and DNS
Setting Up DNS in Linux
Troubleshooting DNS

Name Resolution - WINS and Samba
Server Message Blocks
NetBIOS over TCP/IP
The NetBIOS Naming Convention
Windows Internet Naming Service
Managing WINS
Static Mapping
Replication
Configuring DNS and WINS
Samba and Levels of Access in Samba
SWAT

Implementing Internet Services
File Transfer Protocol Servers
Anonymous Accounts
Implementing Microsoft FTP
Managing FTP in IIS
Creating Virtual FTP Servers
Anonymous Access in IIS
Telnet
The *inetd* Command
Finger
The *hosts.allow* and *hosts.deny* Files

Target Audience

LAN/WAN administrators, systems administrators, systems managers, intranet administrators, network engineers, and internetworking engineers.

Job Responsibilities

Manage and tune corporate Internet and intranet infrastructure; monitor Web server systems, FTP, news and mail servers; configure and deploy e-business solutions servers.

Prerequisites

Students must have CIW Foundations certification or equivalent experience, and have a working knowledge of Windows NT/2000 administration, including installation and configuration.

Duration

12 hours

CIW Server Administrator Series – Course 2:

Advanced Internet System Management

Advanced Internet System Management is a comprehensive three-day course that teaches students how to implement mission-critical services on the Windows 2000 and Red Hat Linux platforms. Students install and configure Web, newsgroup, e-mail and proxy servers; receive in-depth understanding of how to connect e-commerce databases to Web servers; and learn how to enable CGI on Windows 2000 and Linux. Students also learn about backup and load balancing issues, and receive foundational knowledge concerning Internet security. This course is designed for personnel responsible for implementing real-world solutions for company intranets or ISPs that provide Internet Web services.

Topics

Mission-Critical Services
Services Overview
Foundational Services
Types of Mission-Critical Services
System Logging
Performance Monitoring and Server Optimization
Fault Tolerance
High Availability Clustering
Parallel Processing
Backup
Storage Area Networks

Installing and Configuring a Web Server
Web Servers
Server Naming
Aliases and Virtual Directories
Directory Browsing and Default Documents
Common Web Browsers and Servers
Configuring IIS
Virtual Servers
Apache Server
Administering Apache Server
Virtual Servers and Apache

Advanced Web Server Configuration
Web Server Configuration
Hypertext Transfer Protocol (HTTP)
Web Applications and E-Commerce
Server-side Applications and E-Commerce
Web Applications and MIME
E-Commerce Web Servers and Perl
Script Execution in IIS 5.0
Server-side Includes and Application Mapping in Windows 2000
Apache Server and Perl
E-Commerce Web Servers and Gateways
Active Server Pages (ASP)
Open Database Connectivity (ODBC), Web Gateways and E-Commerce
Streaming Media Servers

Enabling Secure Sockets Layer
Secure Sockets Layer (SSL)
SSL Handshake
Applying SSL Encryption
Requesting and Installing Certificates
Certificate Concerns

Configuring and Managing a News Server
News Servers
Network News Transfer Protocol (NNTP) Service

E-Mail Server Essentials
Email Servers
Sending and Delivering E-Mail
E-Mail Agents
E-Mail Server Terminology
Simple Mail Transfer Protocol (SMTP)
Post Office Protocol 3 (POP3)
Internet Message Access Protocol (IMAP)
Lightweight Directory Access Protocol (LDAP)
Web Mail
List Servers

Configuring an E-Mail Server
MX Records and E-Mail Servers
Intradomain E-Mail
Interdomain E-Mail

Proxy Servers
Proxy Servers
Proxy Server Considerations

Logging Activity
Logging Information
HTTP Server Log Files
FTP Log Files
File Analysis Software
Additional Services

Monitoring and Optimizing Internet Servers
Analyzing Server Performance
Queues and Bottlenecks
Correcting Bottlenecks
Hardware Concerns

Fault Tolerance and System Backup
Protecting Data
Fault Tolerance
Additional Fault Tolerance OptionsTape Backup
Planning a Backup Strategy
Disaster Assessment and Recovery

Security Overview
System Security
Server Vulnerabilities
Auditing Your System
Enhancing Server Security Firewalls
Intrusion Detection Systems
Security Tradeoffs
Recognizing Security Breaches

Advanced Internet System Management - Continued

Target Audience

LAN/WAN administrators, systems administrators, systems managers, intranet administrators, network engineers, and internetworking engineers.

Job Responsibilities

Manage and tune corporate Internet and intranet infrastructure; monitor Web server systems, FTP, news and mail servers; configure and deploy e-business solutions servers.

Prerequisites

Students must have CIW Foundations certification or equivalent experience, and have completed the *Internet System Management* course or have equivalent experience with TCP/IP networking and Windows 2000 operation.

Duration and Price

18 hours

Master CIW Administrator and the Internetworking Professional Series

The CIW Internetworking Professional defines network architecture, identifies infrastructure components, and monitors and analyzes network performance. This individual is responsible for the design and management of enterprise TCP/IP networks.

Target Audience

Network engineers, network architects, internetworking engineers, LAN/WAN administrators, systems administrators, systems managers, intranet administrators.

Job Responsibilities

Define network architecture; identify infrastructure components; monitor and analyze network performance; and design, manage and troubleshoot enterprise TCP/IP networks.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410), and
- CIW Server Administrator series certification (exam 1D0-450),

or equivalent experience for those students not seeking Master CIW Administrator certification.

Training/ Experience

Students should take the following courses (or have equivalent experience) before taking the CIW Internetworking Professional 1D0-460 exam:

- **TCP/IP Internetworking** (12 hours)
- **Advanced TCP/IP Concepts and Practices** (18 hours)

Certification Awards

To become Master CIW Administrator certified, students must pass the Foundations 1D0-410, Server Administrator 1D0-450, Internetworking Professional 1D0-460, and Security Professional 1D0-470 exams administered by Prometric, Inc. or VUE.

To earn CIW Professional designation, students must pass CIW Foundations 1D0-410 and any CIW job role series exam.

CIW Internetworking Professional Series – Course 1:

TCP/IP Internetworking

TCP/IP Internetworking is a two-day course designed to teach key Transmission Control Protocol/Internet Protocol (TCP/IP) concepts and protocols so network professionals can effectively plan, deploy and manage a TCP/IP enterprise network. Students will learn to build an enterprise network and analyze TCP/IP application and protocol information.

Topics

The Internet Infrastructure
Overview of Networking
TCP/IP and Interoperability
Internetworking and the Corporate Network
Evolution of the Internet
Internet-related Authorities
OSI Reference Model
Packets
OSI/RM Protocol Examples
Major Networking Protocols
TCP/IP, IPX/SPX, NetBEUI, and Appletalk
Data Link Control (DLC)
Systems Network Architecture (SNA)
Multiprotocol Networks

TCP/IP Architecture
Overview of TCP/IP
Internet Architecture
Request for Comments (RFC)
Internet Protocols
De-multiplexing
Specialized Serial Interface Protocols

Internet Addressing
Introduction to Internet Addressing
Internet Addressing
Internet Address Classes
IP Addressing Rules
Reserved IP Addressing
Subnetworks
Subnet Masks
Custom Subnet Masks
Classless Interdomain Routing (CIDR)

Network Access Layer
Network Access Layer Overview
IEEE Standards and Ethernet
Ethernet Function
Determining Ethernet Addresses
Ethernet Headers
Address Resolution Protocol
Reverse Address Resolution Protocol (RARP)

Internet Layer
Internet Protocol Overview
IP and Routing
IP Header

Transport Layer
Transport Layer Overview
Transport Layer Protocols
Transmission Control Protocol (TCP)
TCP Negotiation Process
User Datagram Protocol (UDP)
TCP and UDP Ports

Domain Name System
Domain Name System Overview
The Hosts File
DNS
DNS Server Types
DNS Hierarchy Example
DNS Records
UNIX and DNS
Windows 2000 and DNS

Address and Parameter Allocation for TCP/IP Hosts
Address and Parameter Allocation Overview
BOOTstrap Protocol (BOOTP)
Dynamic Host Configuration Protocol (DHCP)

Target Audience

Network engineers, network architects, internetworking engineers, LAN/WAN administrators, systems administrators, systems managers, intranet administrators.

Job Responsibilities

Define network architecture; identify infrastructure components; monitor and analyze network performance; and design, manage and troubleshoot enterprise TCP/IP networks.

Prerequisites

Students must have CIW Foundations certification or equivalent experience.

Duration

12 hours

CIW Internetworking Professional Series – Course 2:

Advanced TCP/IP Concepts and Practices

Advanced TCP/IP Concepts and Practices is a three-day course that emphasizes Transmission Control Protocol/Internet Protocol (TCP/IP) routing, network troubleshooting, network management, and next-generation Internet protocol technologies. It guides students through the concepts and protocols used in Internet routing, and teaches them how to troubleshoot TCP/IP networks using a packet sniffer and TCP/IP utilities. Students will configure the Simple Network Management Protocol (SNMP) to effectively manage a network, and implement a functional Internet Protocol, version 6 (IPv6), network in the classroom.

Topics

Routing
Introduction to Routing
Routing Process
Static vs. Dynamic Routing
Routing and Packets
Routing Protocols
Routing Information Protocol (RIP)
Open Shortest Path First (OSPF)
Exterior Gateway Protocol (EGP)
Border Gateway Protocol (BGP)
Classless Interdomain Routing (CIDR)

TCP/IP Troubleshooting Tools
Internet Control Message Protocol (ICMP)
Troubleshooting Network and Name and Address Problems

Troubleshooting TCP/IP Networks
Performance Factors
Identifying Performance Degradation
System and Network Environment
Client/Server Applications

Network Management
Management Functional Areas (MFAs)
Network Management Model
Network Management Architecture

SNMP – Process and Architecture
Popularity and History of SNMP
Structure of Management Information (SMI)
The SNMP Process and Architecture
Common NMS Applications
Agents and Windows 2000 Server
SNMP Agents and UNIX
Agents and Internetworking

Management Information Base
The MIB Tree
MIB Terminology and Groups
Groups Residing Off the Enterprises or Management Group
Accessing MIB Variables

SNMP in the Enterprise
SNMPv1 Message Format, Error Messages and Drawbacks
Remote Network Monitoring MIB (RMON)

IPv6 Introduction and Comparison
The Need for IPv6
The Future and History of Ipv6
IPv4 vs. IPv6: Key Differences
IPv4 New, Removed and Revised Fields

IPv6 Header and Extension Headers
IPv6 Extension Header Order
Windows 2000 and IPv6
Linux and IPv6

IPv6 Address Architecture
IPv4 vs. IPv6 Addresses
IPv6 Address Abbreviation
IPv6 Address Types and Assignments
Aggregatable Global Unicast Addresses
Special Unicast Addresses
Multicast Addresses
Fixed Length vs. Variable Length

IPv6 Routing and Security
Aggregatable Routing Hierarchy
Multicast Routing
Ipv6Routing Protocols and Security

Reduced Network Management (IPv6)
Neighbor Discovery (ND) Protocol
ICMPv6
Plug-and-Play Autoconfiguration
Address Resolution

Transitioning to IPv6
Simple Internet Transition (SIT) Mechanisms
Dual IP Stacks
IPv4 Address Compatibility
IPv6-in-IPv4 Tunneling: The 6Bone

Voice-over Internet Protocol (White Paper)
Converting Voice to Digital Format Using Pulse Code Modulation (PCM)
Transmitting Sound Bytes Using PSTN and Voice-over Internet Protocol (VoIP)
IP Gateway Devices
VoIP Shortcomings and Solutions

SNMPv2 and SNMPv3 (White Paper)
Alterations and Structure of the PDU
Backward Compatibility
Security Architecture

Multicast IP (White Paper)
Multicast Applications and Class D Addresses
IGMP, MBone and Routing Protocols

Mobile IP (White Paper)
Goals, Entities, Functions, and Operations

Target Audience

Network engineers, network architects, internetworking engineers, LAN/WAN administrators, systems administrators, systems managers, intranet administrators.

Job Responsibilities

Define network architecture; identify infrastructure components; monitor and analyze network performance; and design, manage and troubleshoot enterprise TCP/IP networks.

Prerequisites

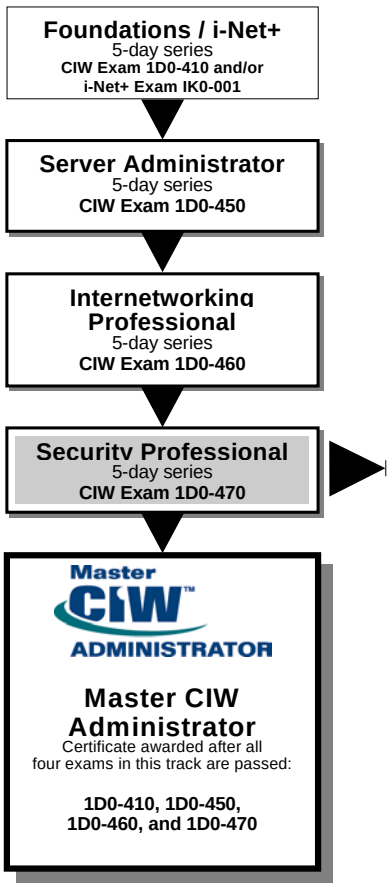
Students must have CIW Foundations certification or equivalent experience, and have completed *TCP/IP Internetworking* or have equivalent knowledge of TCP/IP architecture and core protocols. Experience with UNIX, Novell or Windows NT/2000 systems and network administration is also required.

Duration

18 hours

Master CIW Administrator and the Security Professional Series

The CIW Security Professional implements security policy, identifies security threats, and develops countermeasures using firewall systems and attack-recognition technologies. This individual is responsible for managing the deployment of e-business transaction and payment security solutions.



Target Audience

Network server administrators, firewall administrators, systems administrators, application developers, and IT security officers.

Job Responsibilities

Implement e-business security policies; identify security threats and develop countermeasures using firewall systems and attack-recognition technologies; and manage the deployment of security solutions.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410),
- CIW Server Administrator series certification (exam 1D0-450), and
- CIW Internetworking Professional series certifications (exam 1D0-460),

or equivalent experience for students not seeking Master CIW Administrator certification.

Training/ Experience

Students should take the following courses (or have equivalent experience) before taking the CIW Security Professional 1D0-470 exam:

- **Network Security and Firewalls** (12 hours)
- **Operating Systems Security** (6 hours)
- **Security Auditing, Attacks, and Threat Analysis** (12 hours)

Certification Awards

To become Master CIW Administrator certified, students must pass the Foundations 1D0-410, Server Administrator 1D0-450, Internetworking Professional 1D0-460, and Security Professional 1D0-470 exams administered by Prometric, Inc. or VUE.

To earn CIW Professional designation, students must pass CIW Foundations 1D0-410 and any CIW job role series exam.

CIW Security Professional Series – Course 1:

Network Security and Firewalls

Network Security and Firewalls is a two-day course designed to teach students how to secure networks from unauthorized activity. Students learn about establishing an effective security policy, identifying different types of hacker activities, understanding the hacker's mind-set, and preventing and managing hacker penetration. Students will also learn about authentication procedures, encryption standards and implementations, ports and protocols that hackers manipulate, and how to engage in proactive detection and response/reporting methods.

Topics

What is Security?
Hacker Statistics
What is the Risk?
The Myth of 100 Percent Security
Attributes of an Effective Security Matrix
What You Are Trying to Protect?
Who is the Threat?
Security Standards

Elements of Security
The Security Concepts and Mechanisms
Elements of Security
Encryption
Authentication
Specific Authentication Techniques
Access Control
Auditing
Security Tradeoffs and Drawbacks

Applied Encryption
Reasons to Use Encryption
Creating Trust Relationships
Rounds, Parallelization and Strong Encryption
Symmetric-Key Encryption
Symmetric Algorithms
Asymmetric Encryption
Hash Encryption
Applied Encryption Processes
Public Key Infrastructure (PKI)
Encryption Review

Types of Attacks
Attacks–Categories
Brute-Force and Dictionary Attacks
System Bugs and Back Doors
Social Engineering and Non-direct Attacks

General Security Principles
Common Security Principles: Introduction
Be Paranoid
You Must Have a Security Policy
No System/Technique Stands Alone
Minimize Damage
Deploy Company-wide Enforcement
Provide Training
Use an Integrated Security Strategy
Place Equipment According to Needs
Identify Security Business Issues
Consider Physical Security

Protocol Layers and Security
TCP/IP and Network Security
The TCP/IP Suite and the OSI Reference Model
Physical, Network, Transport and Application Layers

Securing Resources
TCP/IP Security Vulnerabilities
Implementing Security
Resources and Services
Protecting TCP/IP Services
Simple Mail Transfer Protocol (SMTP)
Testing and Evaluating
Implementing a New System
Security Testing Software
Security and Repetition

Firewalls and Virtual Private Networks
Access Control Overview
Definition and Description of a Firewall
The Role of a Firewall
Firewall Terminology
Firewall Configuration Defaults
Creating Packet Filter Rules
Packet Filter Advantages and Disadvantages
Configuring Proxy Servers
Remote Access and Virtual Private Networks (VPNs)
Public Key Infrastructure (PKI)

Levels of Firewall Protection
Basic Firewall Concepts
Firewall Strategies and Goals
Building a Firewall
Types of Bastion Hosts
Hardware Issues
Common Firewall Designs

Putting It All Together

Detecting and Distracting Hackers
Hackers–Inevitable
Proactive Detection
Distracting and Punishing the Hacker

Incident Response
Planning for Response
Create a Response Policy
Decide Ahead of Time
Do Not Panic
Document Everything
Assess the Situation
Stop or Contain Activity
Execute the Response Plan
Analyze and Learn

Target Audience

Network server administrators, firewall administrators, systems administrators, application developers, and IT security officers.

Job Responsibilities

Implement e-business solutions security policies; identify security threats and develop countermeasures using firewall systems and attack-recognition technologies; and manage the deployment of security solutions.

Prerequisites

Students must have passed the CIW Foundations, CIW Server Administrator, and CIW Internetworking Professional exams or have equivalent skills.

Duration

12 hours

CIW Security Professional Series – Course 2:

Operating System Security

Operating System Security is a one-day course designed to teach students the latest security industry recommendations and how to properly protect Windows 2000 and Linux servers in a variety of settings. Students will learn how to protect Windows 2000 and Linux systems from attacks, reconfigure the operating system to fully protect it, and scan hosts for known security problems. By the end of the course, students will have a solid understanding of the security architectures used by Windows 2000 and Linux.

Topics

Security Principles
Overview of Security Principles
Definition of Security
Evaluation Criteria
Security Levels, Mechanisms, and Management
Windows 2000 Security
Windows 2000 Security Architecture
Linux Security
Pluggable Authentication Modules (PAMs)

Account Security
Overview of Securing Accounts
Passwords
Verifying System State
Password Aging in Linux

File System Security
File System Security Overview
Windows 2000 File System Security
Remote File Access Control
Combined Local and Remote Permissions
Linux File System Security

Assessing Risk
Risk Assessment Basics
Security Threats
Windows 2000 Security Risks
General UNIX Security Vulnerabilities
System Port Scanning
UNIX Security Risks
NIS Security Concerns
NFS Security Concerns

Reducing Risk
Risk Reduction Overview
Patches and Fixes
Windows 2000 Registry Security
Disabling and Removing Unnecessary Services in Windows 2000 and UNIX

Internet Security Resources (Appendix)
General, UNIX and Windows NT Resources

Target Audience

Network server administrators, firewall administrators, systems administrators, application developers, and IT security officers.

Job Responsibilities

Implement e-business solutions security policies; identify security threats and develop countermeasures using firewall systems and attack recognition technologies; and manage the deployment of security solutions.

Prerequisites

Students must have passed the CIW Foundations, CIW Server Administrator, and CIW Internetworking Professional exams, and have completed the Network Security and Firewalls course or have equivalent skills.

Duration

6 hours

CIW Security Professional Series – Course 3:

Security Auditing, Attacks, and Threat Analysis

Security Auditing, Attacks, and Threat Analysis is a two-day course that teaches students how to perform different phases of a security audit, including discovery and penetration, and how to prevent unauthorized users from controlling company networks. The course discusses how to use Windows 2000 and Linux to identify security issues and suggest industry-standard solutions. Students will also learn how to generate effective audit reports that can help organizations improve their security and become current with industry security standards.

Topics

Security Auditing
Introduction to Auditing
What is an Auditor?
What Does an Auditor Do?
Auditor Roles and Perspectives
Conducting a Risk Assessment
Risk Assessment Stages

Discovery Methods
Discovery
Security Scans
Enterprise-grade Auditing Applications
Scan Levels
Social Engineering
What Information Can You Obtain?

Auditing Server Penetration and Attack Techniques
Network Penetration
Attack Signatures and Auditing
Common Targets
Routers
Databases
Web and FTP Servers
E-mail Servers
Naming Services
Compromising Services
Auditing for System Bugs
Auditing Trap Doors and Root Kits
Auditing Denial-Of-Service Attacks
Buffer Overflow
Combining Attack Strategies
Denial of Service and the TCP/IP Stack

Security Auditing and the Control Phase
Network Control
Control Phases
UNIX Password File Locations
Control Methods
Auditing and the Control Phase

Intrusion Detection
Intrusion-Detection Systems
What is Intrusion Detection?
IDS Rules
False Positives
Intrusion-Detection Software
Intruder Alert
Purchasing an IDS
Auditing with an IDS

Auditing and Log Analysis
Log Analysis
Baseline Creation
Firewall and Router Logs
Operating System Logs
Filtering Logs
Suspicious Activity
Additional Logs
Log Storage
Auditing and Performance Degradation

Audit Results
Auditing Recommendations
Creating the Assessment Report
Improving Compliance
Security Auditing and Security Standards
Improving Router Security
Enabling Proactive Detection
Host Auditing Solutions
Replacing and Updating Services
Secure Shell (SSH)
SSH and DNS

Target Audience

Network server administrators, firewall administrators, systems administrators, application developers, and IT security officers.

Job Responsibilities

Implement e-business solutions security policies; identify security threats and develop countermeasures using firewall systems and attack-recognition technologies; and manage the deployment of security solutions.

Prerequisites

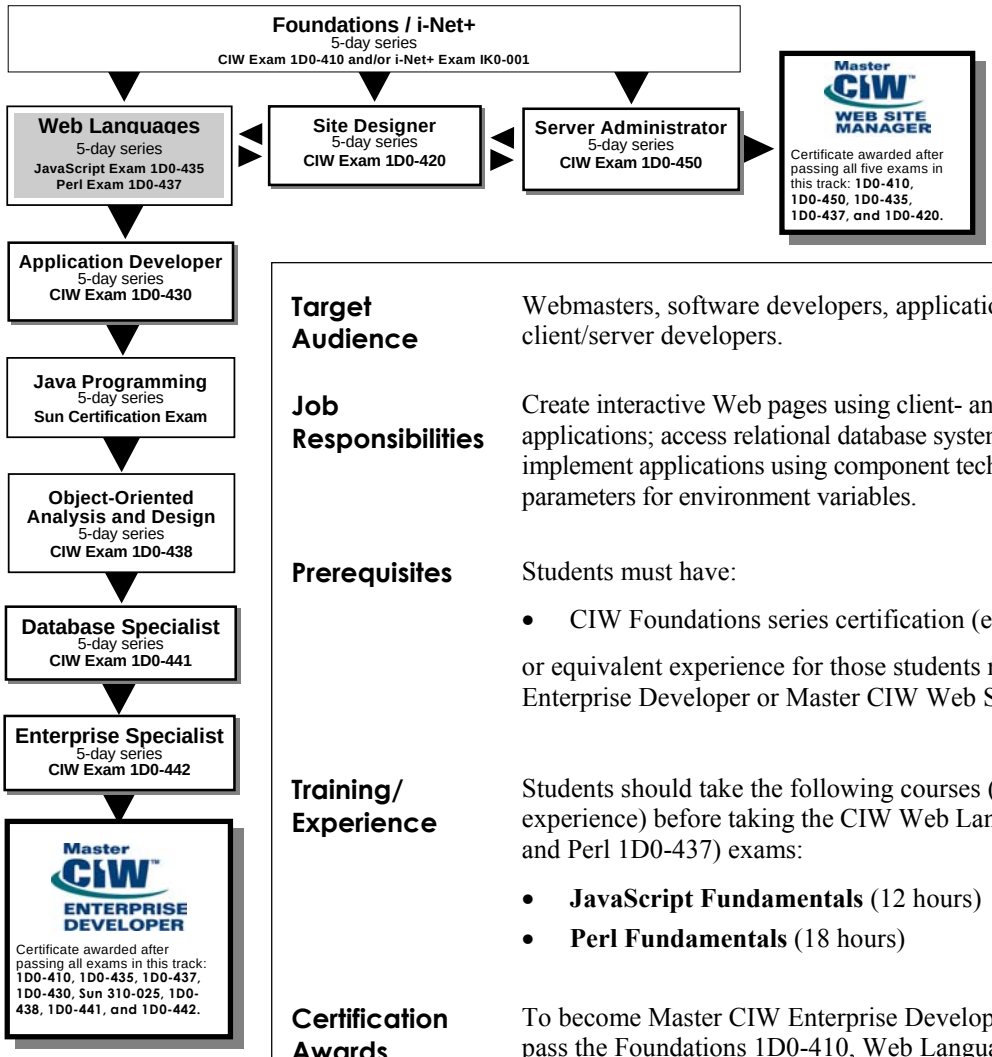
Students must have passed the CIW Foundations, CIW Server Administrator, and CIW Internetworking Professional exams, and have completed the *Network Security and Firewalls* and *Operating Systems Security* courses or have equivalent skills.

Duration

12 hours

Master CIW Enterprise Developer or Master CIW Web Manager and the Web Languages Series

The Web Languages series is not a CIW job role, but it is a language/theory requirement for the Master CIW Enterprise Developer and Master CIW Web Site Manager. Competency in both JavaScript and Perl is necessary before student may take the first CIW job role in this track, the CIW Application Developer series.



Target Audience

Webmasters, software developers, application programmers, and client/server developers.

Job Responsibilities

Create interactive Web pages using client- and server-side Web applications; access relational database systems from Web applications; implement applications using component technology; and create parameters for environment variables.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410)

or equivalent experience for those students not seeking Master CIW Enterprise Developer or Master CIW Web Site Manager certification.

Training/ Experience

Students should take the following courses (or have equivalent experience) before taking the CIW Web Languages (JavaScript 1D0-435 and Perl 1D0-437) exams:

- **JavaScript Fundamentals** (12 hours)
- **Perl Fundamentals** (18 hours)

Certification Awards

To become Master CIW Enterprise Developer certified, students must pass the Foundations 1D0-410, Web Languages 1D0-435 and 1D0-437, Application Developer 1D0-430, Sun Certification Exam 310-025, OO Analysis and Design 1D0-438, Database Specialist 1D0-441, and Enterprise Specialist 1D0-442 exams administered by Prometric or VUE.

To become Master CIW Web Site Manager certified, students must pass the Foundations 1D0-410, Web Languages 1D0-435 and 1D0-437, Site Designer 1D0-420, and Server Administrator 1D0-450 exams administered by Prometric or VUE.

Web Languages Series – Course 1:

JavaScript Fundamentals

JavaScript Fundamentals is a two-day course that teaches developers how to use the features of the JavaScript language to design client-side, platform-independent solutions. Students learn how to write JavaScript programs, script for the JavaScript object model, control program flow, validate forms, animate images, target frames, and create cookies. Students will also understand and use the most popular applications of JavaScript.

Topics

Introduction to JavaScript
Origins of JavaScript
JavaScript Characteristics
Common Programming Concepts
Java and JavaScript
Server-Side vs. Client-Side Applications
Annotating Code with Comments

Working with Variables and Data
Communicating with the User
Using Data More Than Once: Variables
Keywords and Reserved Words
Expressions
Operators
Inline Scripting, Simple User Events, and the *onLoad* and *onUnload* Event Handlers

Functions, Methods and Events
Functions
Methods as Functions
Defining a Function
Calling a Function
User and JavaScript Event Handlers

Controlling Program Flow
Controlling Decisoinal Program Flow
The *if...else* Statement
The *while* Statement
The *for* Statement
The *break* Statement
The *continue* Statement
The *switch* Statement
The *do...while* Statement

The JavaScript Object Model
The JavaScript Object Model
Commonly Used Objects
The *window* Object
The *document* Statement
The *with* Object
The *image* Object
The *history* Object
The *location* Object
The *navigator* Object

JavaScript Language Objects
JavaScript Language Objects
The *String* Object
Additional *String* Object Methods
Evaluating Strings
Regular Expressions
The *Array* Object
The *Date* Object
Setting and Extracting Time Information
The *Math* Object

Developing Interactive Forms
Overview of Form Elements
Referring to *form* Element
The *form* Object
The *button* Object
The *checkbox* Object
The *text* and *textarea* Objects
The *radio* Object
The *select* Object
Form Validation

Cookies and JavaScript Security
Security and Cookies
What Are Cookies?
How Are Cookies Sent?
Who Can Send Cookies?
Storing Cookies
Why Use Cookies?
Assigning a Cookie
Testing for Cookie Presence
Clearing a Cookie
Controlling Cookies in the Browser
Cookies and Passwords
JavaScript Security Issues

Controlling Frames in JavaScript
Using Frames and Windows
Targeting Frames in JavaScript
Changing Two or More Frames
Frames, Functions and Variables
Targeting Windows
Windows, Functions and Variables

Custom JavaScript Objects
Creating Custom Objects
Custom Object Demonstration
Creating the Object: The Contructor
Creating an Instance of a Custom Object
Creating Object Methods
Creating Functions for Your Objects
Complex Custom Objects

Target Audience

Webmasters, software developers, application programmers, client/server developers, and desktop publishers.

Job Responsibilities

Implement and maintain hypertext-based Web sites using authoring and scripting languages; apply human-factors principles to design; create Web content; and use Web management tools and digital media tools.

Prerequisites

Students must have CIW Foundations certification or equivalent experience, and be proficient in Hypertext Markup Language (HTML) authoring. No previous programming experience is required.

Duration

12 hours

Web Languages Series – Course 2:

Perl Fundamentals

Perl Fundamentals is a three-day course that teaches students how to fully utilize the Perl programming language. Students learn the Perl syntax, the basics of using regular expression, how to use Perl data types, and how to access and manipulate files. Students are also introduced to database connectivity and debugging techniques.

Topics

Introduction to Perl
Practical Extracting and Reporting Language (Perl)
Getting Started with Perl
Scalar Variables
Numerical Variables
String Variables
Retrieving Data from STDIN

Flow Control in PERL
Boolean Expressions in PERL
The if statement
The *for*, *while*, and *do {} while* Loop Statements
Loop-Control Commands
I/O Redirection

Regular Expressions in PERL
Introduction to Regular Expressions
Character Classes
Pattern Matching and Substitution

Arrays in Perl
Introduction to Perl Arrays
Accessing Array Elements
The *sort* Function
The *foreach* Statement
The *push, pop, shift* and *unshift* Functions
The *split* and *join* Functions

Hashes in Perl
Introduction to Perl Hashes
Adding and Deleting Hash Elements
The *keys, values, each,* and *reverse* Functions

Subroutines in Perl
Introduction to Perl Subroutines
Variable Scope
References

File Input and Output in Perl
Introduction to Perl File Input and Output
What is a Filehandle?
The *open* Function
Outputting Data to a File

Opening Files for Reading
Determining Information About Files
The *stat* and *lstat* Functions

Environmental Variables and Command Line Arguments
Environment Variables
Command Lines Arguments

Packages and Modules in Perl
Using Packages in Perl
BEGIN and END Blocks
Using Modules in Perl
The *use* and *require* Statements

Object-Oriented Perl
Introduction to Object-Oriented Perl
Creating Objects in Perl
Inheritance

Database Connectivity in Perl
Introduction to Database Connectivity
Database Programming with Perl
Interacting with Databases
Connecting to Databases
Structured Query Language (SQL)
Quoting Operations

Debugging Perl Programs
Introduction to Debugging Perl Scripts
Using the print Command
Using the –w Switch
Using the strict Module
The Perl Debugger
Writing Bug-free Perl Code

Target Audience

Webmasters, software developers, application programmers, client/server developers, and desktop publishers.

Job Responsibilities

Implement and maintain hypertext-based Web sites using authoring and scripting languages; apply human-factors principles to design; create Web content; and use Web management tools and digital media tools.

Prerequisites

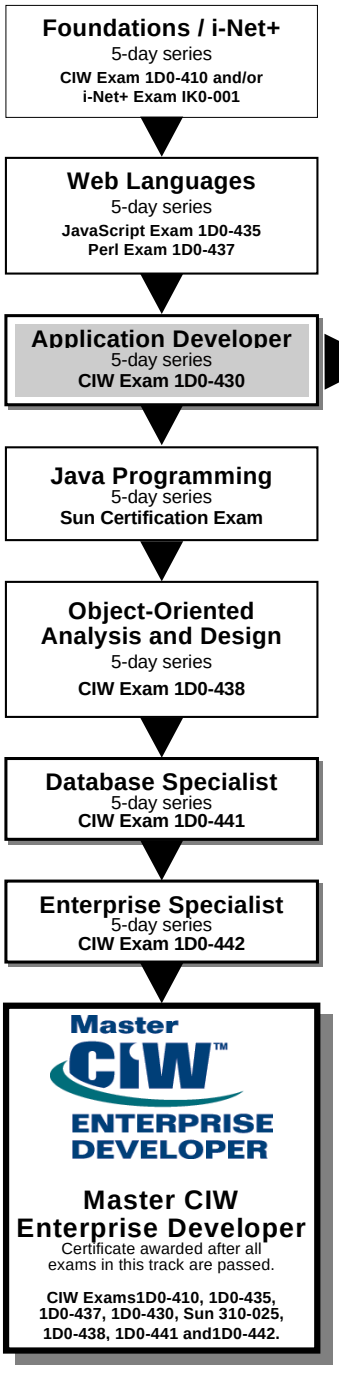
Students must have CIW Foundations certification or equivalent experience, and be proficient in Hypertext Markup Language (HTML) authoring. No previous programming experience is required.

Duration

18 hours

Master CIW Enterprise Developer and the Application Developer Series

The CIW Application Developer builds client- and server-side Web applications using Rapid Application Development tools and component technologies to implement two-tier database connectivity solutions.



Target Audience

Webmasters, software developers, application programmers, and client/server developers.

Job Responsibilities

Create interactive Web pages using client- and server-side Web applications; access relational database systems from Web applications; implement applications using component technology; and create parameters for environment variables.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410), and
- CIW Web Languages certification (JavaScript 1D0-435 and Perl 1D0-437 exams),

or equivalent experience for those students not seeking Master CIW Enterprise Developer certification.

Training/ Experience

Students should take the following two courses (or have equivalent experience) before taking the CIW Application Developer 1D0-430 exam:

- **Fundamentals of CGI Using Perl** (12 hours)
- **Dynamic Server Pages** (18 hours)

Certification Awards

To become Master CIW Enterprise Developer certified, students must pass the Foundations 1D0-410, Web Languages 1D0-435 and 1D0-437, Application Developer 1D0-430, Sun Certified Programmer, OO Analysis and Design 1D0-438, Database Specialist 1D0-441, and Enterprise Specialist 1D0-442 exams administered by Prometric or VUE.

To earn CIW Professional designation, students must pass CIW Foundations 1D0-410 and any CIW job role series exam.

CIW Application Developer Series – Course 1:

Fundamentals of CGI Using PERL

Fundamentals of CGI Programming Using Perl is a two-day course that teaches students how to use Common Gateway Interface (CGI) Perl programs and scripts on a Web server. Students will learn how to write print-to-screen scripts, customize Web page hit counters, create and use business forms that interact with text files, manipulate data in a database, work with a relational database via Open Database Connectivity (ODBC), and explore Web server security issues related to CGI files.

Topics

Application Development Fundamentals
The Application Development Process
Platforms, Languages and Protocols
Client-side Versus Server-side Scripting
Hypertext Transfer Protocol

Introduction to CGI and Perl
Web Architecture Overview
What Is CGI?
Why Use CGI?
What Is Perl?
Why Use Perl?

Creating a Simple Script
Key Concepts and Syntax

Perl Fundamentals
Accessing Environment Variables
Using CGI.pm to Access Environment Variables
The *if* Statement
Logical Expressions
Pattern Matching
Perl Arrays
Passing Values to Functions
Associative Arrays
Loops

Perl File Input and Output Capabilities
File IO Using File Handles
File Modes
Using Files in Scripts
Creating a Hit Counter

Controlling Processing and Output
Introduction to CGI.pm
Incorporating HTML into Perl using CGI.pm
Using CGI.pm to Access Form Data
Processing User-Entered Data
Using One File to Create and Process an HTML Form
Using Perl to Validate Form Input
Testing Your Script Offline

Saving User-supplied Data to a File
Saving Form Data to a File
Modifying Form Data
Pattern Matching Revisited

Reading a File
Introduction to Data Reading
Pattern Matching with Regular Expressions
Substitution

Introduction to Databases
Introduction to Database Programming
Four Steps to Interacting with Databases
Connecting to Databases
Quoting Revisited
Querying Table and Field Names
Web Database Query Example

Deleting and Inserting Database Records
Modifying Data in a Database
The *do* Method
Web Database Control Example

CGI Security Issues
Type of Attacks
Securing the CGI Script
Securing the Server
Securing Form Data
Securing Data Passed to Commands

Resources (Appendix)
Installing Apache Server
Installing Perl on UNIX and Win 32
Requirements Documents

Target Audience

Webmasters, software developers, application programmers, client/server developers, and desktop publishers.

Job Responsibilities

Create interactive Web pages using client- and server-side Web applications; access relational database systems from Web applications; implement applications using component technology; and create parameters for environment variables.

Prerequisites

Students must have CIW Foundations certification or equivalent experience, and have completed the Web Languages series (*JavaScript Fundamentals* and *Perl Fundamental)* or have a working knowledge of client-side scripting, JavaScript or VBScript.

Duration

12 hours

CIW Application Developer Series – Course 2:

Dynamic Server Pages

Dynamic Server Pages is a three-day course that teaches students how to work in the server-side scripting environment. Students learn the basics of application development, and general principles that apply to most development environments. Students develop applications using two specific server-side application development tools: Microsoft Active Server Pages (ASP) and PHP Hypertext Preprocessor (PHP). Students also learn key application standards such as source and revision control, coding standards, code optimization and data integrity.

Topics

Introduction to PHP
What is PHP?
Supported Platforms and Web Servers
Installation and Configuration

PHP Fundamentals
PHP Mechanics
Variables, Operators, Statements, Arrays, and Functions

String Manipulation and File Input/Output
String Functions
Regular Expressions and Pattern Matching
Regular Expression Functions
File Input and Output

PHP and Databases
Relational Databases
Primary Keys and Foreign Keys
Structured Query Language (SQL)
Cursors and ResultSets
Stored Procedures
MySQL and PHP
The PHP Application
PHP and Other Databases

Debugging PHP and PHP Security
Steps for Debugging Code
Preventing Errors
Remote Debugging
PHP Security Issues
Writing Secure PHP Applications

Active Server Pages
ASP Mechanics
What Are ASP Applications?
Virtual Directories and ASP Applications
ASP Delimiters
Global.asa – Starting a Web Application

Using VBScript
Differences Between VBScript and JavaScript
Declaring Variables with VBScript
Program Flow

ASP Intrinsic Objects
ScriptingContext, Server, Application, Session, Request, and Response Objects

ASP Default Components
Using Components
Global Components
ASP Default Components

ActiveX Data Objects
Open Database Connectivity (ODBC) and OLE DB
ActiveX Data Objects
Registering Data Source Names (DSN)
Visual InterDev

Error Handling and Debugging ASP Applications
Debugging ASP Applications
Handling Errors
The *Err* Object
Logging Errors
Script Debugger

Project Management in Application Development
Project Management Fundamentals
Source and Revision Control
Coding Standards
Code Optimization
Test Assessment Plans

Data Integrity and Security Issues
Data Design Fundamentals
Database Security Issues
User Authorization
Goals for Security
Encryption
Symmetric, Asymmetric, and One-Way Algorithms
Protocols

Target Audience

Webmasters, software developers, application programmers, client/server developers, and desktop publishers.

Job Responsibilities

Implement and maintain hypertext-based Web sites using authoring and server-side scripting languages; apply human-factors principles to design; create Web content; and use Web management tools and digital media tools.

Prerequisites

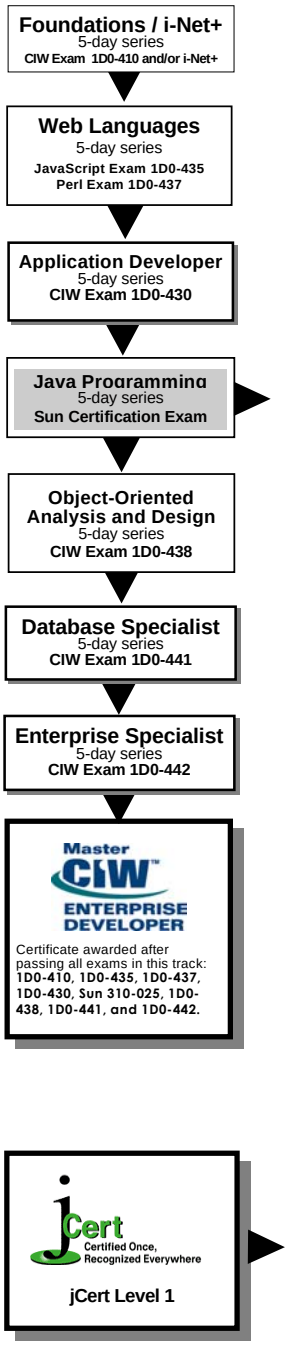
Students must have CIW Foundations certification or equivalent experience, and have completed the Web Languages series (*JavaScript Fundamentals* and *Perl Fundamentals)* and the *Fundamentals of CGI Using Perl* courses or have a working knowledge of client-side scripting, JavaScript or VBScript.

Duration

18 hours

Master CIW Enterprise Developer/jCert Level 1 and the Java Programming Series

The Java Programming series is not a CIW job role, but it is a language/theory requirement for Master CIW Enterprise Developer and jCert Level 1 certification. Competency in Java programming is necessary before students may take CIW Object-Oriented Analysis and Design (also required for jCert), CIW Database and Enterprise Specialist series, and the jCert Solution Developer certification exams.



Target Audience

Database developers and administrators, Internet application developers, middleware programmers, Java developers, and client/server developers.

Job Responsibilities

Develop n-tier database and legacy connectivity solutions for Web applications using Java, Java APIs, Java Database Connectivity solutions, middleware tools, and distributed object models.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410),
- Web Languages certification (exams 1D0-435 and 1D0-437), and
- CIW Application Developer series certification (exam 1D0-430),

or equivalent experience for those students not seeking Master CIW Enterprise Developer certification.

Training/ Experience

Students should take the following five-day course (or have equivalent experience) before taking the 310-025 Sun Certified Programmer for the Java Platform exam:

- **Java Programming Fundamentals** (30 hours)
- It is recommend, but not required, for students take the **Sun Certified Java Programmer Exam Preparation Guide course** (18 hours) prior to taking the 310-025 exam.

Certification Awards

To become Master CIW Enterprise Developer certified, students must pass the Foundations 1D0-410, Web Languages 1D0-435 and 1D0-437, Application Developer 1D0-430, Sun Certification Exam 310-025, OO Analysis and Design 1D0-438, Database Specialist 1D0-441, and Enterprise Specialist 1D0-442 exams administered by Prometric or VUE.

By passing the 310-025 Sun Programmer exam, students fulfill the requirements for Master CIW Enterprise Developer and jCert Level 1. For more information about jCert certification, please visit the jCert Initiative Web site at *www.jcert.org*.

Java Programming Series – Course 1:

Java Programming Fundamentals

Java Programming Fundamentals is a five-day course designed to teach students how to write Java applications and applets in Java 2. Students will learn the Java language mechanics found in other programming languages and object-oriented theory as it relates to Java. They will create Graphical User Interfaces (GUIs) for both applications and applets, and will implement the SDK 1.2 event delegation model for use in practical situations. Students will also complete a course-long project to create an operational client/server messaging system.

Topics

Java Runtime Environment
Java Virtual Machine
Java 2 Software Development Kit

Data Types, Variables, and Operators
Data Types
Declaring Variables
Variable Scope
Casting
Operators
Automatic Casting

Control Statements
Code Blocks
Conditional Statements
Iterative Statements (Loops)

Methods
Java Methods
Return Statements and Calling Methods
Parameters, Pass by Value, Overloading

Arrays
Initializing and Using Arrays
Objects
Passing an Array to a Method
Garbage Collection
Command Line Parameters

Classes and Objects
Object-Oriented Programming
Instance and Class Members
Abstraction
Object References

Inheritance
What Is Inheritance?
Overriding Methods
Overridden Methods and Variables

Constructors
Using Constructors
The Keyword *this*
Constructor Processes and Callbacks
Strings and StringBuffer

Interfaces and Abstract Classes
Interfaces
Polymorphism
Abstract Classes

Packages and Access Modifiers
Introduction to Packages and Access Modifiers
Java 2 API
Encapsulation

Swing Components
AWT
Swing and Basic Swing Components
Swing Containers
JavaBeans

Layout Managers

Graphics in Java
Graphics, Color and Font Class

The Delegation Model
Events
JDK 1.0 and SDK 1.2 Event Handling

Inner Classes
Inner Classes for Event Handling

Java Applets
Programming Applets
Applets and Web Browsers Converting Applications into Applets
Converting Applets into Applications
Exceptions
Handling Exceptions
Creating User-Defined Exceptions
Exception Handling Tips
Exceptions and Inheritance

Creating Threads and Thread Methods
How Operating Systems Handle Multitasking
Types of Threads in Java
Creating Threads
Thread Methods

Thread Synchronization
Thread Synchronization and Racing
Synchronized and the Object Monitor
Thread Race Conditions
Sophisticated Thread Synchronization
Stopping, Suspending and Resuming Threads
Deadlocks

Streams and Serialization
InputStream, OutputStream, Reader and Writer Files
Stream Classes of java.io.*
Serialization

Networking in Java
Connecting Computers Across the Internet
Networking Classes of java.net.*
The Java Client/Server Model
Building an EchoServer
Multithreading Client/Server Examples

Target Audience

Database developers, Internet application developers, database architects, middleware programmers, database administrators, Java developers, and client/server developers.

Job Responsibilities

Develop n-tier database and legacy connectivity solutions for Web applications using Java, Java APIs, Java Database Connectivity solutions, middleware tools, and distributed object models such as CORBA/ORB and IIOP.

Prerequisites

Students must have CIW Foundations and CIW Application Developer certification or equivalent experience, and have a solid working knowledge of a programming language such as C, Pascal, or C++.

Duration

30 hours

Java Programming Series – Course 2: Elective

Sun Certified Java Programmer Exam Preparation Guide

Sun Certified Java Programmer Exam Preparation Guide is a three-day course that reviews the objectives and topics addressed in the *Sun Certified Programmer for the Java 2 Platform* exam. This course can be taught as part of an instructor-led program or used as a self-study exam preparation guide. In this course, students will learn how to properly create Java source files, and define packages and all form of classes and interfaces. Students will learn the fundamentals of the Java language, including flow control structures, variable and method declarations, operators and assignments, and garbage collection. Students will also be introduced to threads and thread control, and to the `java.awt` package and the Collections API.

Topics

Java Language Fundamentals
Java Source Files
Keywords
Primitive Data Types
The Java *main* Method
Variable Initialization
The Math Class
Garbage Collection

Java Modifiers
Introduction to Java Modifiers
Classes
Methods
Variables
Static Initializers

Flow Control In Java
The *while, do,* and *for* Loops
The *continue, break, if/else* and *switch* Statements
Exceptions
Throwing and Catching Exceptions

Operators and Assignments
Introduction to Expressions
Unary, Arithmetic, Binary Shift, Comparison, Short-Circuit, Ternary and Assignment Operators

Object Orientation
Encapsulation
Abstraction
Method Overloading and Overriding
Constructors
Inner Classes
Arrays Threads
Creating Threads
Thread States
Thread Synchronization

The java.awt Package
Layout Managers
Events

The Collections API
Introduction to Collections
The Collections API
Using the Collections API

Target Audience

Internet application developers, database architects, middleware programmers, Java developers, and client/server developers.

Job Responsibilities

Develop n-tier database and legacy connectivity solutions for Web applications using Java, Java APIs, JDBC solutions, middleware tools, and distributed object models such as CORBA/ORB and IIOP.

Prerequisites

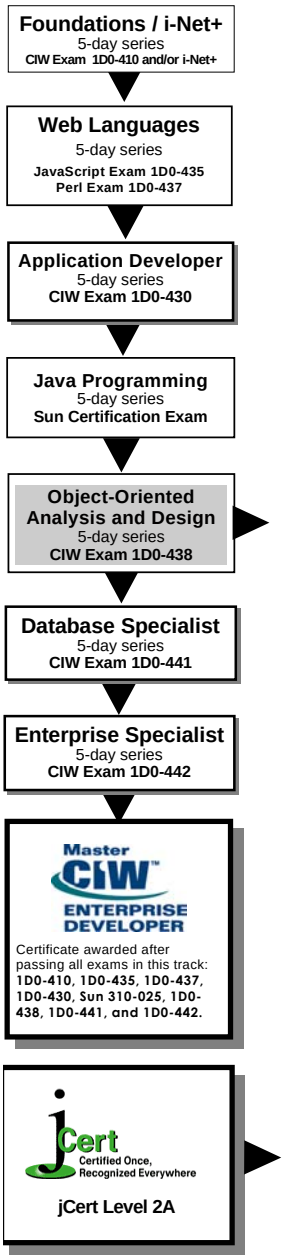
Students must have taken the CIW *Java Programming Fundamentals* course or have equivalent experience programming in Java.

Duration

18 hours

Master CIW Enterprise Developer/jCert 2A and the Object-Oriented Analysis and Design Series

The Object-Oriented Analysis and Design series is not a CIW job role, but it is a language/theory requirement for Master CIW Enterprise Developer and jCert Level 2A certification. Competency in Object-Oriented theory is necessary before students may take the last two CIW job roles in this track, the CIW Database and Enterprise Specialist series, and is a requirement for jCert Certified Developer status.



Target Audience

Database developers and administrators, Internet application developers, middleware programmers, Java developers, and client/server developers.

Job Responsibilities

Develop n-tier database and legacy connectivity solutions for Web applications using Java, Java APIs, Java Database Connectivity solutions, middleware tools, and distributed object models.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410),
- Web Languages certification (exams 1D0-435 and 1D0-437),
- CIW Application Developer series certification (exam 1D0-430), and
- Sun's Java Programmer certification,

or equivalent experience for those students not seeking Master CIW Enterprise Developer certification.

Training/ Experience

Students should take the following five-day course (or have equivalent experience) before taking the OO Analysis and Design 1D0-438 exam (one exam for CIW and jCert 2A requirements):

- **Object-Oriented Analysis and Design** (30 hours)

Certification Awards

To become Master CIW Enterprise Developer certified, students must pass the Foundations 1D0-410, Web Languages 1D0-435 and 1D0-437, Application Developer 1D0-430, Sun Certification Exam 310-025, OO Analysis and Design 1D0-438, Database Specialist 1D0-441, and Enterprise Specialist 1D0-442 exams administered by Prometric or VUE.

By passing the 1D0-438 OO Analysis and Design exam, students fulfill the requirements for Master CIW Enterprise Developer and jCert Level 2A. For more information about jCert certification, please visit the jCert Initiative Web site at *www.jcert.org*.

Object-Oriented Analysis and Design Series Course:

Object-Oriented Analysis and Design

Object-Oriented Analysis and Design is a five-day course that teaches object-oriented analysis and design techniques using UML in the context of the Unified Software Development Process. The course provides an introduction to object-oriented theory and the software development life cycle. Students learn proper analysis and design procedures, and their roles in the development process. Students gain hands-on experience with all phases of the development process: requirements, analysis, design, construction, and testing.

Topics

Section I — The Object Paradigm

Introduction to Software Engineering
Evolution of Software Engineering
Object Technology
Advantages and Disadvantages of an Object-Oriented Approach
Analysis and Design

Understanding the Object Paradigm
Classes
Encapsulation
Abstraction
Object Relationships
Application Objects

Inheritance and Polymorphism
Inheriting Attributes and Methods
Extending Components with Inheritance
Polymorphism
Abstract Classes
Multiple Inheritance
Subtyping vs. Subclassing

Software Development Life Cycle
Software Development Life Cycle Model
Waterfall Life Cycle Model
V-Shaped Life Cycle Model
Incremental Life Cycle Model
Spiral Life Cycle Model

Section II — Tools of Analysis and Design

The Unified Software Development Process
Software Development Process
The Unified Process
Life Cycle of the Unified Process
Cycles, Phases, Iterations, Core Workflows, and Workflows and Iterations

Unified Modeling Language (UML)
Models
Views

Computer-Aided Software Engineering (CASE)
Introduction to CASE
Selecting a CASE Tool

Section III — The Requirements Workflow

The Requirements Workflow
Introduction to Requirements Capture
Activities of the Requirements Workflow
Requirements and the Unified Process

Use-Case Modeling
Introduction to Use-Case Diagrams
Developing a Use-Case Model

Activity Diagrams
Branches and Merges
Forks and Joins
Library System Activity Diagrams

Interface Design and Prototyping
User Interface Design
User Interface Ergonomics
User Interface Prototyping
Specifying System Interfaces

Section IV — The Analysis Workflow

The Analysis Workflow
Introduction to Analysis
Analysis Classes
Use-Case Realizations – Analysis
Analysis and the Unified Process

Analysis Modeling
Collaboration Diagrams
Flow of Events and Special Requirements
Class-Responsibility-Collaboration Cards
Class Analysis

Section V — The Design Workflow

The Design Workflow
Design Model
Use-Case Realizations – Design
Design and the Unified Process

Architecture Modeling
Package Diagrams
Deployment Diagrams

Class Diagrams
Association, Aggregation, Composition, and Generalization
Check Out Asset Class Diagram

Sequence Diagrams
Return Values, Message Conditions, Deletion, Multiplicity, and Return Stack

Statechart Diagrams
States, Transitions, and Superstates

Design Quality Issues
Elements of Good Design
Object-Oriented Design Metrics
Chidamber and Kemerer
Metrics for Object-Oriented Design
Designing for Reuse

The Model-View-Controller Paradigm (MVC)
Model-View-Controller
Building MVC Classes
Hybrid MVC

Refactoring
Identifying New Methods
Identifying Methods That Can Be Moved, Inheritance Opportunities
Clarifying Variable Names

Object-Oriented Analysis and Design – Continued

Section VI — The Implementation Workflow

The Implementation Workflow
Identifying Components
Integration Build Planning
Generating Code from Design Classes
Unit Testing
Implementation and the Unified Process

Section VII — The Test Workflow

The Test Workflow
Test Cases, Procedures and Components
Test and the Unified Process

Target Audience

Database developers and administrators, Internet application developers, middleware programmers, Java developers, and client/server developers.

Job Responsibilities

Develop n-tier database and legacy connectivity solutions for Web applications using Java, Java APIs, Java Database Connectivity solutions, middleware tools, and distributed object models.

Prerequisites

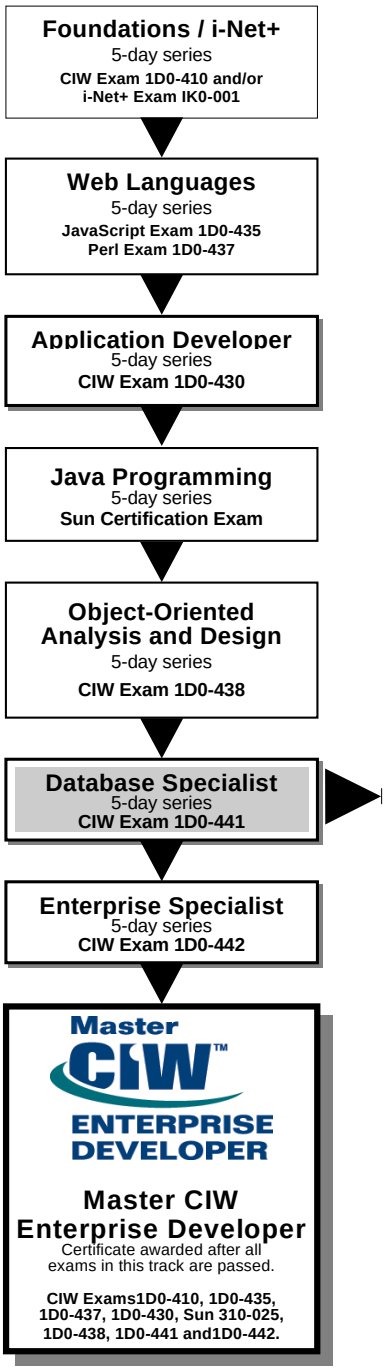
Students must have CIW Foundations certification or equivalent experience, and have completed the Java Programming series (*Java Programming Fundamentals*) or have equivalent experience with an object-oriented programming language.

Duration

30 hours

Master CIW Enterprise Developer and the Database Specialist Series

The CIW Database Specialist plans and designs relational databases. This individual defines the structure of a database, employs Entity Relationship (ER) diagrams and normalization to optimize databases, builds database client applications, and performs database maintenance and security administration.



Target Audience

Application developers, programmers, enterprise developers, Web developers, and database developers.

Job Responsibilities

Design, implement, and maintain database schemas; design and develop database client applications and components; and perform database administration and maintenance.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410) and CIW Web Languages certification (JavaScript 1D0-435 and Perl 1D0-437 exams), and
- Java Programming (Sun Certification) and Object-Oriented Analysis and Design series certification (exam 1D0-438),

or equivalent experience for those students not seeking Master CIW Enterprise Developer certification.

Training/ Experience

Students should take the following two courses (or have equivalent experience) before taking the CIW Database Specialist (1D0-441) exam:

- **Database Design Methodology** (18 hours)
- **Building Database Client Applications Using JDBC 2.0** (12 hours)

Certification Awards

To become Master CIW Enterprise Developer certified, students must pass the Foundations 1D0-410, Web Languages 1D0-435 and 1D0-437, Application Developer 1D0-430, Sun Certified Programmer, OO Analysis and Design 1D0-438, Database Specialist 1D0-441, and Enterprise Specialist 1D0-442 exams administered by Prometric or VUE.

To earn CIW Professional designation, students must pass CIW Foundations 1D0-410 and any CIW job role series exam.

CIW Database Specialist Series – Course 1:

Database Design Methodology

Database Design and Methodology is a three-day course that teaches students how to plan and design relational databases. Students will learn about the theory behind relational databases, relational database nomenclature, and relational algebra. The course includes sections on the Structured Query Language (SQL) and optimizing databases through normalization. Students will apply their knowledge with hands-on exercises designed to teach the intricacies of database design methodology.

Topics

Introduction to Databases
Introduction to Databases
What Is a Database?
Relational Databases and Database Management Systems (DBMSs)
Origins of Relational Databases

Relational Database Fundamentals
Introduction to Relational Databases
Multitier Database Architecture
Relational Model Terminology
Using Tables to Represent Data
Data Models
Entities and Data Relationships
Relational Integrity
Database Languages
Data Dictionaries

Database Planning
Introduction to Database Planning
Database Design Life Cycle
Database Requirements Document
Case Study
Selecting a DBMS
Selecting an Application Interface

Overview of Database Design Methodology
Introduction to Database Design Methodology
Effects of Poor Database Design Practices
Database Design Phases
Conceptual Database Design
Entity-Relationship Models

Normalization
Introduction to Normalization
What Is Normalization?

Logical Database Design
Introduction to Logical Database Design
Logical Database Design
Creating a Logical Data Model
Using a Database Definition Language
Validating the Logical Data Model
Defining Integrity Constraints
Creating an Enterprise Data Model

Physical Database Design
Introduction to Physical Database Design
Physical Database Design
Creating Enterprise Constraints
Using Secondary Indexes
Denormalization
Creating User Views
Designing Database Access Rules

Structured Query Language
Introduction to Structured Query Language
SQL Basics
Data Definition Language
Data Manipulation Language
Data Control Language

Relational Algebra
Introduction to Relational Algebra
Defining Relational Algebra

Transactions and Database Security
Introduction to Database Transactions and Security
Transactions
Concurrency Control
Database Security

Target Audience

Application developers, programmers, enterprise developers, Web developers, and database developers.

Job Responsibilities

Design, implement, and maintain database schemas; design and develop database client applications and components; and perform database administration, security and maintenance.

Prerequisites

Students must have with a minimum of two years of professional experience with databases, a programming language and web-related programming projects.

Duration

18 hours

CIW Database Specialist Series – Course 2:

Building Database Client Applications Using JDBC 2.0

Building Database Client Applications Using JDBC 2.0 is a two-day course that teaches students how to build database client applications using JDBC 2.0. Students will learn how to apply the JDBC API to connect to relational databases; issue SQL statements and queries; and use transactions, prepared statements, stored procedures and metadata to create and manipulate database information. Students will apply the knowledge they learn in class by building a graphical client application.

Topics

Introduction to JDBC
JDBC - The Basics
Relational Databases
Structured Query Language
System Architecture

Using JDBC Drivers
JDBC Drivers
Establishing a Connection

Executing SQL Statements
The Statement Interface
Transactions Using SQL Statements

Prepared Statements and Stored Procedures
Prepared Statements
Stored Procedures

Metadata
Introduction to Metadata
DatabaseMetaData
ResultSetMetaData

SQLException
Introduction to SQLException
try and catch Blocks
SQLException Methods

Scrollable and Updatable Result Sets
Scrollable Result Sets
Updatable Result Sets

Batch Updates
Introduction to Batch Updates
Parameterized Batch Updates
BatchUpdateException

Building Applications Using JDBC
Application Development in JDBC

Target Audience

Application developers, programmers, enterprise developers, Web developers, and database developers.

Job Responsibilities

Design, implement, and maintain database schemas; design and develop database client applications and components; and perform database administration, security and maintenance.

Prerequisites

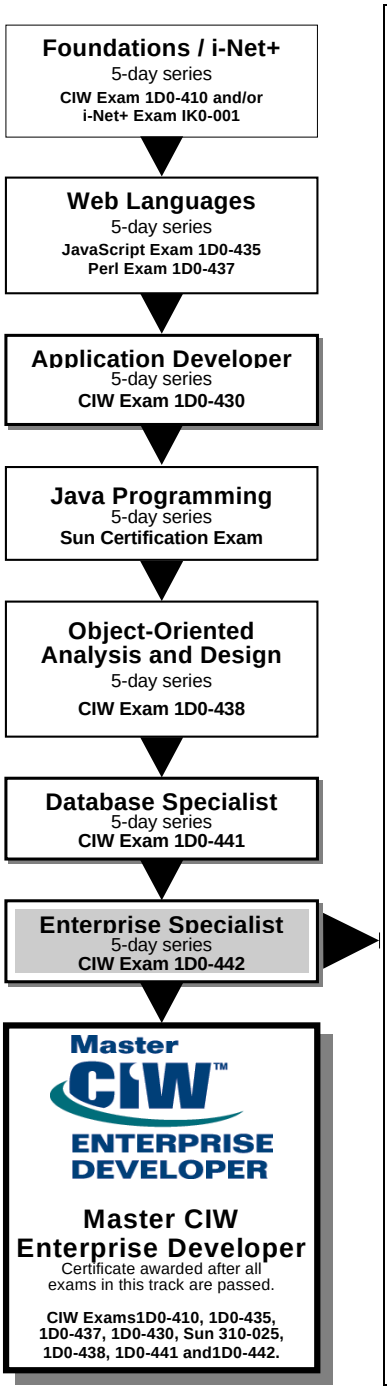
Students must have completed *Java Programming Fundamentals* or have an equivalent knowledge of Java programming before taking this course. It is also recommended that students complete the *Database Design Methodology* course or have a basic knowledge of the purpose and function of databases.

Duration

12 hours

Master CIW Enterprise Developer and the Enterprise Specialist Series

The CIW Enterprise Specialist builds n-tier database business applications solutions using Java in conjunction with distributed application architecture technologies such as Enterprise JavaBeans and CORBA. The Enterprise Specialist designs, develops, and deploys complete software solutions tailored to a given business domain.



Target Audience

Database developers and administrators, Internet application developers, middleware programmers, Java developers, and client/server developers.

Job Responsibilities

Employ distributed application architecture technologies (including JavaBeans and CORBA); synthesize knowledge of system architecture design, database design and connectivity; create complete software solutions using the Java programming language and API.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410) and CIW Web Languages certification (JavaScript 1D0-435 and Perl 1D0-437 exams), and
- Java Programming (Sun certification), CIW Object-Oriented Analysis and Design series certification (exam 1D0-438) and CIW Database Specialist series certification (1D0-441),

or equivalent experience for those students not seeking Master CIW Enterprise Developer Certification.

Training/ Experience

Students should take the current 5-day series, or have equivalent experience, before taking the CIW Enterprise Specialist (1D0-442) exam:

- **Distributed Object Computing Using Java and CORBA** (12 hours)
- **Enterprise JavaBeans** (18 hours)

Certification Awards

To become Master CIW Enterprise Developer certified, students must pass the Foundations 1D0-410, Web Languages 1D0-435 and 1D0-437, Application Developer 1D0-430, Sun Certified Programmer, OO Analysis and Design 1D0-438, Database Specialist 1D0-441, and Enterprise Specialist 1D0-442 exams administered by Prometric or VUE.

To earn CIW Professional designation, students must pass CIW Foundations 1D0-410 and any CIW job role series exam.

CIW Enterprise Specialist Series – Course 1:

Distributed Object Computing Using Java and CORBA

Distributed Object Computing Using Java and CORBA is a two-day course that introduces students to the fundamentals of distributed object computing using CORBA. Students learn how to choose and install an ORB as well as the fundamentals of the Interface Definition Language (IDL), including how IDL maps to Java. Students also get hands-on experience building client and server applications that use static invocation and the Dynamic Invocation Interface.

Topics

Introduction to CORBA
CORBA Overview
The Object Management Group
CORBA Architecture

Interface Definition Language
Introduction to IDL
Basics of IDL
Inheritance and IDL
Nonclass Data Types
Parameter Passing Modes
Exceptions

Building CORBA Clients
Client IDL Stubs
Initializing the ORB
Using the Naming Service
Invoking Remote Methods
Using Out and Inout Parameters

Building CORBA Servers
Server IDL Skeletons
Implementing CORBA Objects
CORBA Objects and the Naming Service
Waiting for Invocation
Using Out and Inout Parameters

Factory and Callback Objects
Factory Objects
Callback Objects

CORBA Exceptions
Introduction to CORBA Exceptions

Dynamic Invocation Interface
Introduction to DII
Constructing an Argument List
Preparing for the Return Value
Invoking the Request
Extracting Return Values

Target Audience

Database developers and administrators, Internet application developers, middleware programmers, Java developers, and client/server developers.

Job Responsibilities

Develop n-tier database and legacy connectivity solutions for Web applications using Java, Java APIs, Java Database Connectivity solutions, middleware tools, and distributed object models.

Prerequisites

Students must have CIW Foundations certification or equivalent experience, and have completed the *Java Programming Fundamentals* course or have a working knowledge of Java and client and server programming.

Duration

12 hours

CIW Enterprise Specialist Series – Course 2:

Enterprise JavaBeans

Enterprise JavaBeans is a three-day course that teaches the fundamentals of Enterprise JavaBeans (EJB). Students learn about the Java 2 Platform, Enterprise Edition (2JEE) technologies; EJB concepts, methodology, and development; EJB-compliant servers, and how Enterprise JavaBeans are used by remote client applications. Students also learn about database connectivity and transactions. The course teaches them to develop session beans and entity beans, and offers hands-on experience working with Enterprise JavaBeans.

Topics

Introduction to Server-side Component Software
Software Components
Component Architectures
Multi-tier Architectures
CORBA and Object Request Broker (ORB)
Java 2, Enterprise (2JEE) Technologies

Enterprise JavaBeans Overview
EJB Architecture
Client Interaction with Enterprise JavaBeans
EJB Container Services
The EJB Home Object
The EJB Object
Types of Enterprise JavaBeans
Deployment Descriptors
The EJB-JAR File

Creating a Session Bean
Creating the Enterprise Bean Class
Stateless and Stateful Session Beans
Writing Business Methods for an Enterprise Bean
The Home Interface
The EJB Object
Exceptions in EJB
Example: A Session Bean
The Library Application

Enterprise JavaBeans Deployment
The Deployment Descriptor
Environment Data
Using Bean References
Using Resource Factories
Assembler/Deployer Roles with the DD
EJB Deployment in an EJB Server

Enterprise JavaBeans Clients
Using JNDI
Creating an EJB Instance
Removing the Enterprise Bean
Client Sample

Entity Beans
What Is an Entity Bean?
Primary Keys
Entity Bean Architecture
Bean-Managed Persistence
Entity Bean Methods
Using Finder Methods
The Remote Interface
The Home Interface

Container-Managed Persistence
The Primary Key
EJB Methods and CMP
The Deployment Descriptor and CMP
Example: A CMP Entity Bean

Transactions in Enterprise JavaBeans
What Are Transactions?
Participants in Transactions
Properties of Transactions
EJB Transactional Model
Distributed Transactions
Isolation Levels
Transactions in EJB
Container-Managed Transactions
Bean-Managed Transactions

Enterprise JavaBeans Security
Introduction to EJB Security
Defining Users, Principals and Roles
Security and the Deployment Descriptor

Target Audience

Database developers and administrators, Internet application developers, middleware programmers, Java developers, and client/server developers.

Job Responsibilities

Develop n-tier database and legacy connectivity solutions for Web applications using Java, Java APIs, Java Database Connectivity solutions, middleware tools, and distributed object models.

Prerequisites

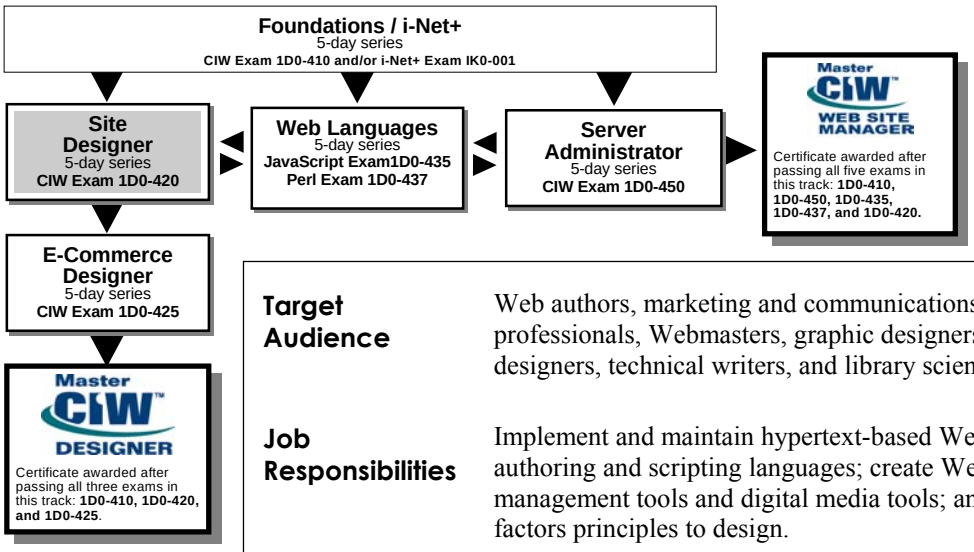
Students must have CIW Foundations certification or equivalent experience, and have completed *Java Programming Fundamentals* or have a working knowledge of Java and client and server programming.

Duration

18 hours

Master CIW Designer and the Site Designer Series

The CIW Site Designer applies human-factors principles to designing, implementing, and maintaining hypertext-based publishing sites using authoring and scripting languages, content creation and management tools, and digital media tools.



Target Audience

Web authors, marketing and communications professionals, PR professionals, Webmasters, graphic designers, desktop designers, technical writers, and library scientists.

Job Responsibilities

Implement and maintain hypertext-based Web sites using authoring and scripting languages; create Web content; use Web management tools and digital media tools; and apply human-factors principles to design.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410)

or equivalent experience for those students not seeking Master CIW Designer or Master CIW Web Site Manager certification.

Training/ Experience

Students should take the following five-day course, or have equivalent experience, before taking the CIW Site Designer 1D0-420 exam:

- **Design Methodology and Technology** (30 hours)

Certification Awards

To become Master CIW Designer certified, students must pass the Foundations 1D0-410, Site Designer 1D0-420 and E-Commerce Designer 1D0-425 exams administered by Prometric, Inc. or VUE.

To become Master CIW Web Site Manager certified, students must pass the Foundations 1D0-410, Site Designer 1D0-420, Web Languages 1D0-435 and 1D0-437, and Server Administrator 1D0-450 exams administered by Prometric, Inc. or VUE.

To earn CIW Professional designation, students must pass CIW Foundations 1D0-410 and any CIW job role series exam.

CIW Site Designer Series Course:

Design Methodology and Technology

Design Methodology and Technology is a five-day course that teaches students how to create and manage Web sites with tools such as Macromedia Dreamweaver 4.0 and Flash 5.0, FrontPage 2000, Dynamic HTML, and various multimedia and CSS standards. Students will also implement the latest strategies to develop third-generation Web sites, evaluate design tools, discuss future technology standards, and explore the incompatibility issues surrounding current browsers. The course focuses on theory, design and Web construction, along with information architecture concepts, Web project management, scenario development and performance evaluations.

Topics

Overview of Design Concepts
Web Technology
The Nature of the Web
Design Concepts
New Technologies
Evaluating Your HTML Skills

Web Page Layout and Elements
Web Users and Site Design
Effective Web Page Layout
Color and Web Design
Fonts and Web Design

Web Site Usability Testing
The Importance of Audience Usability
Web Usability Testing

Navigation Concepts
Why Is Navigation Critical?
Browsers and Navigation
Primary and Secondary Navigation
Navigation Hierarchy
Site Structure, URLs and File Names
Familiar Navigation Conventions
Guided Navigation
Navigation Action Plan

Web Graphics
Web Site Images
Digital Imaging Concepts
Bitmap vs. Vector Graphics
Graphic Applications
Image File Formats
Creating Images
Image Optimization

Multimedia and the Web
Multimedia and Web Sites
Current Multimedia Capabilities
Animation and the Web
Audio and the Web
Video and the Web
Goals of a Multimedia Site
Multimedia Site Design Basics
User Interaction
Selecting Multimedia Elements
Copyright Infringement

The Web Development Process
Web Design Teams
Bottom-up Approach
Web Development Phases
Defining the Web Project Goals
Understanding the Business Process
Defining a Vision
From Vision to Strategy
The Metaphor

Mindmapping
The Mindmapping Process
Mindmapping a Web Site

Web Site Implementation Factors
Determining Site Implementation Factors
Web Site Characteristics
Calculating Download Times

HTML Standards and Compliance
What Is HTML?
Web Browser HTML Support
The HTML Standard
HTML 1.0, 2.0, 3.0 and 3.2
HTML 4.0, 4.01 and XHTML
Web Page Accessibility

HTML Tables and Web Page Structure
Creating Page Structures with Tables
Diagramming the Table
Borderless Web Page Structure

HTML Frames
Frames and Framesets
<FRAMESET> and <FRAME> Tags
Targeting Hyperlinks
Adding a Frame to a Frame
Frameset Attributes
The <NOFRAMES> Tag

Metadata and the Web
Metadata
<META> Tags and Document Identification
<META> Tags and Search Engines
<META> Tags and Delayed File Change

Metadata and the Web
Metadata
<META> Tags and Document Identification
<META> Tags and Search Engines
<META> Tags and Delayed File Change

Cascading Style Sheets
Style Sheets
Cascading Style Sheets
Defining and Using Styles
Changeable Style Elements

Site Development with Microsoft FrontPage 2000
Microsoft FrontPage 2000
FrontPage Views, Menus and Toolbars
Opening Webs and Files in FrontPage

FrontPage 2000 – Basic Features
Page Layout Using Tables
Inserting Images, Page Properties, Image Maps, Templates
Importing Formatted Text
Inserting HTML
Creating Text Hyperlinks
FrontPage Shared Borders, Framesets, Styles, Themes

FrontPage 2000 – Advanced
FrontPage DHTML Toolbar, Web Forms, Components, Web Reports and Search Forms

Site Development with Macromedia Dreamweaver
Dreamweaver 4.0
Layout Options

Macromedia Dreamweaver – Basic Features
Page Layout, Creating Image Maps and Templates in Dreamweaver
Frames

Design Methodology and Technology – Continued

Macromedia Dreamweaver – Advanced Features
Rollover Images, Web Forms, Behaviors, Modifying Layers, Library
Editing HTML, Jump Menus
Macromedia Dreamweaver Exchange

Web Pages with Allaire HomeSite
Allaire HomeSite 4.5
Templates, Handling Files and Tag Editing Features

Images with JASC Paint Shop Pro
Introduction to JASC Paint Shop Pro
Adding Text to an Image File
Special Effects and Filters
Decreasing Color Depth
Cropping Images
Creating Screen Captures
Creating Animated GIF Images

Multimedia with Macromedia Flash 5.0
Flash 5.0
Flash Shapes
Color and Fills in Flash
Timeline and Layers
Saving and Publishing Flash Movies
Symbols and Buttons
Customizing the Flash Library
Flash, Motion and Shape Tweens
Tweening Text in Flash
Flash Movie Clips
Adding Sound
Adding Flash Movies to HTML files
Testing for the Flash Plug-in
Flash Tell Targets
Mask Layers in Flash

JavaScript Fundamentals
Why Script?
Common Programming Concepts
What Is JavaScript?
JavaScript vs. Other Languages
Embedding JavaScript into HTML
Strengths of JavaScript
Using JavaScript to Communicate with the User
JavaScript Functions
Using JavaScript for Browser Detection

Dynamic HTML
Dynamic HTML
Document Object Model (DOM)
CSS and DHTML
Scripting Language and DHTML
DHTML Implementation

Extensible Markup Language (XML)
What Is XML?
HTML Goals
Separating Format from Structure
HTML Limitations
XML Goals
What Is an XML Document?
Rules for Well-Formed XML
Simple Well-Formed XML
What Is XHTML?

HTTP Servers
What Is an HTTP Server?
Ports
Basic HTTP Server Administration
Server-Side Technologies

Cookies
Understanding Cookies
Enabling and Disabling Cookies
Deleting Cookie Files

Downloadables and Plug-Ins
Plug-In Technology
Plug-In Installation
Macromedia Shockwave and Flash
Adobe Acrobat Reader
RealNetworks RealPlayer
Creating a Downloadable File

Java Applets
Why Use Java and Applets?
Introduction to Java
Demystifying Applets
Embedding a Java Applet
Java Applets and Animation
Java Applet Authoring Tools
Applet Resources

Databases
Web Design and Databases
Database Anatomy
Database Queries
Database Management System (DBMS)
Tools, Products and Database Programs

Standards Organizations
Internet Governing Bodies
Internet Society (ISOC)
Internet Architecture Board (IAB)
Internet Research Task Force (IRTF)
Internet Engineering Task Force (IETF)
World Wide Web Consortium (W3C)
Internet Corporation for Assigned Names and Numbers (ICANN)
Requests for Comments (RFCs)

Web Workshop
Building Your Web Site

Web Site Publishing
Web Site Publishing
Web Site Hosting
Web Publishing with FTP
Publishing with FrontPage 2000
Publishing with Dreamweaver 4.0
Comparing Web Publishing Tools

Target Audience

Web authors, marketing and communications professionals, PR professionals, Webmasters, graphic designers, desktop designers, technical writers, and library scientists.

Job Responsibilities

Implement and maintain hypertext-based Web sites using authoring and scripting languages; create Web content; use Web management tools and digital media tools; and apply human-factor principles to design.

Prerequisites

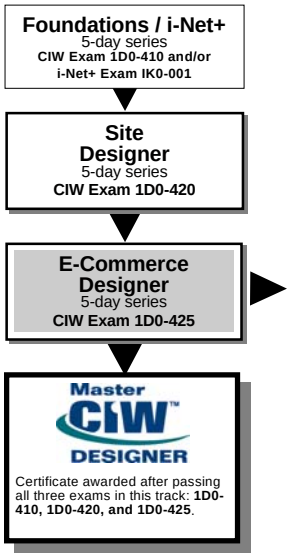
Students must have CIW Foundations certification or equivalent experience.

Duration

30 hours

Master CIW Designer and the E-Commerce Designer Series

The CIW E-Commerce Designer focuses on standards, technologies and practices for both business-to-business and business-to-consumer e-commerce models. This individual understands and facilitates relationships among marketing, promotion, customer service, user interaction, purchasing methods, and secure transactions by using SSL and SET, payment gateways, inventory control, shipping and order information and site performance testing and evaluation.



Target Audience

Webmasters, marketing and communications professionals, network server administrators, systems administrators, application developers, IT security officers and Web authors.

Job Responsibilities

Design and implement commerce-driven Web sites; identify customer needs; monitor customer usage patterns; determine order processes and service after sales; and consider how e-business solutions can increase sales.

Prerequisites

Students must have:

- CIW Foundations series certification (exam 1D0-410), and
- CIW Site Designer series certification (exam 1D0- 420),

or equivalent experience for those students not seeking Master CIW Designer certification.

Training/ Experience

Students should take the following five-day course (or have equivalent experience) before taking the CIW E-Commerce Designer 1D0-425 exam:

- **E-Commerce Strategies and Practices** (30 hours)

Certification Awards

To become Master CIW Designer certified, students must pass the Foundations 1D0-410, Site Designer 1D0-420 and E-Commerce Designer 1D0-425 exams administered by Prometric, Inc. or VUE.

To earn CIW Professional designation, students must pass CIW Foundations 1D0-410 and any CIW job role series exam.

CIW E-Commerce Designer Series Course:

E-Commerce Strategies and Practices

E-Commerce Strategy and Practices is a five-day course that teaches students how to conduct business online and how to manage the technological issues associated with constructing an electronic-commerce Web site. Students will implement a genuine transaction-enabled business-to-consumer Web site, examine strategies and products available for building electronic-commerce sites, examine how such sites are managed, and explore how they can complement an existing business infrastructure. Students get hands-on experience implementing the technology to engage cardholders, merchants, issuers, payment gateways and other parties in electronic transactions.

Topics

Electronic Commerce Foundations
Introduction
Impetus for Web Commerce
Electronic Commerce Predictions
How These Concepts Apply to Our Focus Companies
Types of Electronic Commerce
Advantages of Electronic Commerce
Issues in Electronic Commerce
E-Commerce Solutions
Hardware and Software
Ingredients of a Web Storefront
Seven Ingredients to Success
The Virtual Enterprise
Site Implementation
E-Commerce Guidelines

Law and the Internet
Introduction to Internet Legal Issues
Electronic Publishing
Intellectual Property Issues
Areas of Liability
Privacy and Confidentiality
Jurisdiction, Internet Taxation, International Tax, Customs and Tariffs
Protecting a brand

Web Marketing Goals
Web Marketing Benefits
Who Is Doing It Right? Cisco, Amazon
Marketing Goals and Strategies
Drivers and Barriers to Growth
Hard Goods vs. Soft Goods
Product Pricing
Global vs. Niche: Mass vs. Micro
Product Distribution and Availability
Demographics, Psychographics, and Audience Data
Focus Groups and Surveys

Online Product Promotion
Online Promotions, Site Categories, and Banner Ads
Effective Banner Ads
Finding Banner Ad Space
Advertising Representatives
Banner Ad Positioning and Tracking
Banner Exchange
Referrer Programs
Banner Ad Performance
Customer Incentives
Search Engine Placement
<META> Tags and Search Engines
E-Mail
Offline product promotion

Site Usability
Click Patterns
Screen Flow and Usability Analysis

Commerce Consumer Service Methods
Customer Service Overview
E-Service and E-Service Methods
Synchronous and Asynchronous Service in E-Commerce
Self Service in E-Commerce
E-Service Action Plans
Customer Relationship Management

Business-to-Business Frameworks
Business-to-Consumer (B2C)
Business-to-Business (B2B)
Electronic Data Interchange (EDI)
Internet EDI and Security
XML/EDI
Open Buying on the Internet (OBI)
Open Trading Protocol (OTP)
B2B Marketplaces, Portals and Hubs
E-Business
Supply Chain and Procurement
Procurement
Inventory, Shipping and Order-Tracking Data
Freight and Shipping
Language Translation and Localization
Inter-office Productivity and Cost Reduction Tools

Site Creation Packages: Outsourcing
The Online Instant Storefront
- Online Instant Storefront Overview
- Online Outsourcing Solutions

The Mid-level Offline Instant Storefront
- Offline Instant Storefront Overview
- Mid-level Offline Storefront Products

The High-level Offline Instant Storefront
- High-level Offline Instant Storefront Overview
- High-level Offline Storefront Packages
- Auctions, the Other E-Commerce Option

Site-Creation Software
Web Server Overview
Internet Information Server (IIS)
Preparation and Examining IIS

Site Development Software Implementation – Microsoft Platform
Site Development Considerations
Choosing Web Site Development Software
Relational Databases and Database Management Systems (DBMSs)
Development Tools and Commerce Server 2000

Developing An E-Commerce Site Using Commerce Server
Solution Site
Business Desk
Customization Overview
Look and Feel

Online Catalog
Catalog Design and Components
Building an Internet Catalog
Commerce Server 2000 Catalog Methodology
Afrikunda Catalog
Catalog Editor and Order
Linking the Catalog

E-Commerce Strategies and Practices – Continued

Using and Configuring Payment Gateways
Payment Gateway Overview and Methods
Credit Card Processing and Digital Cash
Electronic Commerce Security Myths
Payment Gateways
Test Purchase
VeriSign Manager
Batching and Online Check Processing

E-Services Support
Services and Support in E-Commerce
Knowledge Base
RightNow Web Administration
Customizing User Interface and Integrating

Transaction Security
Purpose of Security
Encryption and Decryption
Authentication and Identification
Payment and Purchase Orders Process
Certificates
X.509v3
Obtaining, Installing and Using Certificates
VeriSign Certificates
Securing Afrikunda
Payment and Security Requirements

Web Site Management and Performance Testing
Site Management
Basics of Web site performance
Logging Information
HTTP Server Log Files
Performance Testing and Monitoring
Analyzing Sever Performance
Correcting Bottlenecks
Hardware Concerns

Target Audience

Network server administrators, firewall administrators, systems administrators, application developers, IT security officers and Webmasters.

Job Responsibilities

Design and implement commerce-driven Web sites; identify customer needs; monitor customer usage patterns; determine order processes and service after sales; and consider how e-business solutions can increase sales.

Prerequisites

Students must have CIW Foundations certification or have equivalent experience.

Duration

30 hours

