I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to prepare students for employment as Database Security Professionals and E-Commerce Security Professionals, or to provide supplemental training for persons previously or currently employed in occupations such as E-commerce Developers, E-commerce Coordinators, E-commerce Web Site Support Specialists, Database Administrators, Database Architects, Database Developers, or Enterprise Specialist. Elements from this program could also be used to supplement training programs for Web Technicians, Internet/Intranet Administrators, Web Administrators, and Internet Support Specialists.

The content prepares individuals to work in Internet, intranet, extranet, and enterprise environments; installing, configuring, designing, and managing secure database and E-commerce resources.

II. **LABORATORY ACTIVITIES:** Laboratory activities are an integral part of this program and include the use of computers, computer software, and networking/internetworking hardware and software.

III. **COMPLEMENTARY SOFTWARE AND EQUIPMENT:** The following tools and equipment are required for this program: servers, workstations, peripheral devices, network operating systems software, Web server software, email server software, database server and client software, e-commerce software, hacking toolkits, Web browser software, FTP client software, Web authoring software, firewall software, proxy servers, backup software and hardware, data communications tools, LAN and WAN network infrastructures, routers and switches, communication servers, remote access software and hardware, VPN software and hardware, anti-virus software, network analyzers, network monitors, packet sniffers and scanners, penetration testing and reconnaissance software, quantitative analysis software, Web analysis software, database management software.
software, and encryption software.

IV. INSTRUCTOR QUALIFICATIONS:
   Preferred:
   Masters Degree in Field or Masters degree and 18 hours in Management
   Information Systems, Computer Programming, Database Management Systems,
   Information Studies, or Information Science. Experience working in networking
   related fields such as Network Security Analyst, Database Administrator,
   Internetwork Systems Administrator, Webmaster, Web Programming, WebDBA,
   or related area. Industry Certification in appropriate area.

   Minimum:
   Associate Degree and two or more years of related work experience.

V. WORK/LEARN CYCLES: The cooperative method of instruction including
   internship and apprenticeship is strongly recommended for this program.
   Whenever the cooperative method is offered, the following is required for each
   student: a training plan (signed by the student, teacher and employer) which
   includes instructional objectives and a list of on-the-job and in-school learning
   experiences; a work station which reflects equipment, skills and tasks that are
   relevant to the occupation which the student has chosen as a career goal. It is
   recommended that the student receive monetary compensation, as well as credit,
   for work performed.

VI. DISTANCE LEARNING DELIVERY: Effective distance learning in technical
   degree programs is sometimes difficult to accomplish due to the need for student
   participation in skills activities as part of the curriculum. Complete programs,
   however, can be offered successfully for those students in which time and
   geographical distance are restricting factors. This is accomplished by using
   distance-learning materials for concept/theory mastery and skills labs that allow
   the student to complete the skill objectives of the curriculum across a variety of
   schedules.

   A distinction should be made between distance learning products that contain
   conceptual and theoretical content ("content products") as opposed to those that
   may serve merely as a framework for such content ("delivery products"). Many
   products contain both elements, but each product should be examined with this
   distinction in mind.

   Presently available delivery products offer a variety of delivery mechanisms that
   utilize both synchronous and asynchronous tools to allow interaction with
   instructors, fellow students, and practicing professionals. A good delivery product
   should include the following components: An online grade book and progress
   status report; grade reporting tool for students to view grades; quiz development
   tool; administration tools, such as grade distribution status reports and other
   statistical data; backup, download, and upload tools; student and Web page access
tracking; glossary and index tools; assignment drop-box; email and discussion tools; chat room and white board; capability to incorporate multimedia; student presentation component; easily accessible Help files; and course announcement tools. Two of the most popular of these programs are Blackboard and WebCT.

Many studies and comparative evaluations of distance learning products have been performed over recent years and results are often published on the Web. A list of web sites containing information related to this issue can be found in Appendix A.

The Florida Community College Distance Learning Consortium (web site at www.distancelearn.org) contracts each year with a number of vendors offering a computer based training (CBT) in a broad spectrum of information technology topics. Florida community colleges can select courses covering those topics appropriate for their programs to enhance both traditional and online offerings within this degree.

Three major CBT products that contain conceptual and theoretical content related to this program have been documented and compared in the appendices at the end of this framework. The products reviewed were:
   - Course Technology (www.course.com)
   - NetG (www.netg.com)
   - SmartForce (www.smartforce.com)
The appendices include a comparative analysis of each product's basic attributes, listings of the content modules offered by each of these products, and a mapping of this framework's outcomes to these modules.

VII. MODEL FOR ACCELERATED WORKFORCE EDUCATION:
Instead of the traditional sixteen-week course model, classes could be given in an accelerated eight-week model. These classes would meet five hours per week. Due to the technical nature of these classes, each class should meet for a minimum of two and one-half hours per session. Another accelerated option available is a four-week model with each course meeting ten hours per week, preferably two hours per day, five days a week. A hybrid model combining instructor-led training and online Internet modules is another alternative.

VIII. SPECIAL NOTES: Industry certifications have become an important measure of success in the information technology fields. Whenever possible, current industry certifications should be addressed within the program.

The traits and attitudes necessary for success within this program include: creativity, persistence, tenacity, logic/reasoning ability, technical aptitude, flexibility, detail-orientation, stamina, forthrightness, honesty, vision, solutions-orientation, ethical, ability to work under stress, open-minded, eager to learn, analytic, dependability, and the ability to anticipate and detect security violations.
This degree requires the inclusion of the minimum number of credits of general education coursework required by SACS.

IX. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

**General Education Requirements (credits as required by SACS):**
- Demonstrate communication skills. (English)
- Perform problem solving activities and math computations. (Math)
- Develop human relations skills. (Humanities)
- Demonstrate knowledge of Physical Science. (Science)
- Demonstrate knowledge of Social Science. (Social Science)

**Foundation Courses:**

**Computer/Networking Core**
01.0 Demonstrate an understanding of computer hardware.
02.0 Demonstrate an understanding of networked environments, hardware, and software.
03.0 Install and configure secure network systems software and utilities.
04.0 Demonstrate proficiency with Internet structure, organization, and navigation.
05.0 Demonstrate an understanding of network access control systems and methodology.
06.0 Describe cryptography concepts, standards, and applications.
07.0 Perform telecommunications and network security activities.

**Database Core**
08.0 Demonstrate an understanding of Database Management Systems.
09.0 Perform administrative tasks related to database security.

**E-commerce Core**
10.0 Demonstrate an understanding of E-commerce.
11.0 Perform tasks related to e-commerce security.
12.0 Perform Web site management activities.

**Operations Core**
13.0 Design and implement physical security measures.
14.0 Perform operations and security management practices.
15.0 Employ applications and systems development security techniques.
16.0 Develop business continuity and disaster recovery plans.
17.0 Describe ethical issues, pertinent laws, and how to conduct investigations.

**Professional Core**
18.0 Perform general organizational computing workplace competencies.
19.0 Perform project planning and management activities.
20.0 Perform documentation and technical reference activities.
21.0 Demonstrate employability skills.
22.0 Demonstrate professional development skills.
Database / E-Commerce Security Frameworks

2001

Florida Community College System

Curriculum Framework

Program Title: Database / E-Commerce Security

Foundation Courses

01.0 Demonstrate an understanding of computer hardware. The student will be able to:
   01.01 Describe multiple numbering systems used to represent instructions and data, including binary, octal, decimal, and hexadecimal.
   01.02 Identify the architecture of major hardware platforms.
   01.03 Describe the functions of major hardware components of a computer system.
   01.04 Discuss the potential impact of emerging hardware technologies
   01.05 Perform preventive maintenance tasks on microcomputer systems.
   01.06 Set up and configure computer systems and peripherals.
   01.07 Configure the Basic Input/Output System (BIOS) of a computer system.
   01.08 Install and configure storage devices, controllers, and network interfaces.

02.0 Demonstrate an understanding of networked environments, hardware, and software. The student will be able to:
   02.01 Discuss fundamental network concepts such as topology, protocols, architecture, and internetworking.
   02.02 Define all layers in the Open Systems Interconnect (OSI) and Transmission Control Protocol/Internetworking Protocol (TCP/IP) network protocol models.
   02.03 Discuss the nature of Internetworking Protocol (IP) addresses and Media Access Control (MAC) addresses, and mapping between protocol addressing schemes.
   02.04 Describe the functions and hardware requirements for current popular network servers for such services as: Domain Name Service (DNS), Dynamic Host Configuration Protocol (DHCP), e-mail, the World Wide Web (WWW), proxy, etc.)
   02.05 Describe the major functions and hardware requirements of network client hardware components.
   02.06 Describe current link technologies such as twisted-pair, coaxial, fiber optic, and wireless.
   02.07 Describe the major functions of network connectivity hardware, such as hubs, repeaters, bridges, routers, switches, and gateways.
   02.08 Describe the function of network storage devices and other peripherals
such as a Redundant Arrays of Inexpensive Disks (RAID) and CD-ROM towers.

03.0 **Install and configure secure network systems software and utilities.** The student will be able to:
03.01 Install and configure current leading system software, drivers, and service packs.
03.02 Install, configure and set up a proxy server and a gateway.
03.03 Discuss the functions of authentication protocols and Virtual Private Networks (VPNs).
03.04 Configure e-commerce servers and database servers.
03.05 Install and configure mailing list servers, chat servers, and newsgroup servers.
03.06 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
03.07 Install and configure a secure desktop client operating system.
03.08 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring, and upgrading typical applications software.
03.09 Install and configure client software for network-based applications such as e-mail, Web browsing, terminal emulation, file transfer, group conferencing, database, etc.
03.10 Install and configure current popular network servers for such services as: Domain Name Service (DNS), Dynamic Host Configuration Protocol (DHCP), e-mail, the World Wide Web (WWW), proxy service, etc.)

04.0 **Demonstrate proficiency with Internet structure, organization, and navigation.** The student will be able to:
04.01 Describe Internet structure and administration, including such topics as Requests For Comments (RFCs) and the Domain Name System (DNS).
04.02 Describe common Internet services and port numbers.
04.03 Demonstrate the use of internetworking protocols, including: Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), e-mail protocols such as Simple Message Transfer Protocol (SMTP) and Post Office Protocol (POP3), Telnet, etc.).
04.04 Differentiate between push and pull technologies?
04.05 Demonstrate the use of typical remote access mechanisms such as Telnet.
04.06 Describe the data format and proprietary nature of commonly used Internet file types.
04.07 Demonstrate use of Internet clients and services such as e-mail, Web browsers, search engines, newsgroups, mailing lists, chat rooms, file transfer clients, etc.
05.0 Demonstrate an understanding of network access control systems and methodology. The student will be able to:

05.01 Specify by access control mechanisms what users can do, which resources they can access, and what operations they can perform on a system.

05.02 Compare and contrast several access control techniques, including access control lists, discretionary, mandatory, lattice-based, rule-based, and role-based access control.

05.03 Administer computer, group, and user accounts.

05.04 Manage policies, rights, permissions, and passwords for users and/or groups of users.

05.05 Demonstrate an understanding of various access control models including the Bell-LaPadula, Biba, Clark and Wilson, and State Machine Models.

05.06 Oversee password and PIN selection, management, and control.

05.07 Demonstrate an understanding of alternative methods to identification and authentication, including characteristic-based or biometric techniques, tokens, tickets, one-time passwords, and single sign-on techniques.

05.08 Implement centralized/remote authentication access controls such as RADIUS and TACACS.

05.09 Implement and manage decentralized access controls such as domains and trusts relationships.

05.10 Analyze methods of server attack, including brute force, denial of service, spoofing, spamming, sniffers, hackers, and crackers.

05.11 Demonstrate an understanding of the different types of intrusions and the different methods of intrusion detection, including data extraction, sampling, recognition and traffic analysis.

05.12 Monitor the network using various forms of intrusion detection resources to detect attacks.

05.13 Investigate audit trails for signs of network intrusions.

05.14 Perform penetration testing to find weaknesses in the access control systems.

06.0 Describe cryptography concepts, standards, and applications. The student will be able to:

06.01 Demonstrate an understanding of the encryption/decryption process.

06.02 Demonstrate an understanding of the basic functions involved in key management including creation, distribution, verification, revocation, destruction, storage, recovery, and life span of keys.

06.03 Utilize various forms of cryptography, digital certificates, and digital signatures to achieve confidentiality, integrity, authentication, and non-repudiation in an enterprise data communications network.

06.04 Discuss the creation and use of digital certificates and digital signatures to provide authentication of users and verification of data integrity in
network communications.

06.05 Employ cryptographic algorithms such as DES, RSA, MD5 and DSA.
06.06 Identify the strengths and weaknesses of cryptographic algorithms and the
effects of key length.
06.07 Implement current popular key distribution methods including manual,
Kerberos™, and Internet Security Association and Key Management
Protocol (ISAKMP).
06.08 Utilize application and network-based protocols such as Secure Socket
Layer (SSL), Secure HyperText Transfer Protocol (SHTTP), and
06.09 Describe the use of hardware components such as smart cards and tokens.

07.0 Perform telecommunications and network security activities. The student will be
able to:
07.01 Utilize protocol layering models such as the Open Systems
Interconnection (OSI) model in analyzing network security threats.
07.02 Evaluate the security implications involved with the various physical
media types such as fiber optics, twisted pair, and wireless
communications.
07.03 Describe security concerns with using certain network topologies such as
star, bus, mesh, and ring.
07.04 Configure authentication protocol services such as RADIUS/TACACS to
provide dial-in authentication and security.
07.05 Employ network monitors and packet sniffers to identify security threats.
07.06 Implement security measures using hardware and software such as
firewalls, routers, switches, gateways, and proxies.
07.07 Discuss the security vulnerabilities of the Transmission Control
07.08 Configure Network Layer security protocols such as Internetworking
07.09 Configure Transport Layer security protocols such as Secure Socket Layer
(SSL).
07.10 Utilize Secure Multipurpose Internet Mail Extensions (S/MIME), Secure
Socket Layer (SSL) and other Application Layer security protocols.
07.11 Perform connection verification and authentication using Challenge
Handshake Authentication Protocol (CHAP) and Password Authentication
Protocol (PAP).
07.12 Demonstrate an understanding of how wide area network serial line
protocols such as Frame relay, X.25, High-level Data Link Control
(HDLC), Point-to-Point Protocol (PPP) and Integrated Services Digital
Network (ISDN), and Digital Subscriber Line (DSL) work.
07.13 Implement secure data communication techniques such as Virtual Private
Networks (VPNs), tunneling, Network Address Translation (NAT), and transmission logging.

07.14 Develop secure e-mail, facsimile, and voice communication procedures to protect against network attacks such as flooding, eavesdropping, sniffing, spamming, etc. and describe appropriate countermeasures.

07.15 Employ alarms and signals to alert network security administrators of intrusions.

08.0 Demonstrate an understanding of Database Management Systems. The student will be able to:

08.01 Compare the major types of databases including relational, flat file, distributed and object-oriented databases.

08.02 Describe the concept of relational database concepts including tables, entity-relationships, queries, and normalization.

08.03 Analyze the various components of a database management system.

08.04 Install and configure database server software from leading vendors.

08.05 Perform database administration tasks using the Structured Query Language (SQL).

08.06 Demonstrate an understanding of transactions processing and concurrency control.

08.07 Perform database backup and recovery operations.

08.08 Employ techniques to ensure database integrity and security.

09.0 Perform administrative tasks related to database security. The student will be able to:

09.01 Develop database security guidelines.

09.02 Monitor database security systems.

09.03 Manage web database security.

09.04 Verify security compliance.

09.05 Secure backup processes.

09.06 Verify backup processes.

10.0 Demonstrate an understanding of e-commerce. The student will be able to:

10.01 Describe e-commerce and its impact on business and society.

10.02 Differentiate between the various e-commerce business models.

10.03 Describe the development of an e-commerce business plan.

10.04 Discuss e-commerce revenue streams and e-commerce market sectors.

10.05 Develop e-commerce marketing plan.

10.06 Discuss the steps necessary to maintain transaction integrity.

10.07 Identify components and procedures necessary to process credit card
transactions.

11.0 Perform tasks related to e-commerce security. The student will be able to:
   11.01 Manage digital certificates.
   11.02 Maintain integrity in transaction storage and reporting systems.
   11.03 Protect credit card, personal, banking, and "bill to" and "ship to"
        information in transaction processes.
   11.04 Oversee inventory control.
   11.05 Maintain email security related to e-commerce.
   11.06 Review third-party transaction processing.
   11.07 Assist in evaluating e-commerce platform vulnerabilities.

12.0 Perform Web site management activities. The student will be able to:
   12.01 Describe the process of obtaining an Internet domain name and mapping it
        to an Internet Protocol (IP) address.
   12.02 Compare features of currently available Web site management tools.
   12.03 Configure current Web server software such as Apache Web Server and
        Microsoft Internet Information Server (IIS).
   12.04 Use current Web server software to create and maintain a secure Web site.
   12.05 Use Web site access tracking and analysis tools to evaluate the security of
        a Web server.

13.0 Design and implement physical security measures. The student will be able to:
   13.01 Identify the physical threats to an enterprise’s resources that include the
        employees, facilities, data, equipment, support systems, media, and
        supplies they utilize.
   13.02 Diagnose an enterprise’s physical vulnerabilities to threats from natural
        disasters such as fire, flooding, and power loss.
   13.03 Specify possible countermeasures to physically protect an enterprise’s
        resources and sensitive information.
   13.04 Develop a list of physical facility requirements to secure the premises.
   13.05 Evaluate the applicability of technical controls such as smart cards, access
        logs, and intrusion detection systems.

14.0 Perform operations and security management practices. The student will be able
    to:
   14.01 Perform personnel administrative management operations, including
        specifying job requirements, background checking, job rotation and
        termination procedures.
   14.02 Implement anti-virus solutions on an enterprise-wide basis.
14.03 Perform backups of critical information.
14.04 Protect the privacy of personal data.
14.05 Demonstrate proper handling including marking, handling, storage and destruction of sensitive information and media.
14.06 Demonstrate an understanding of different control types such as directive, preventive, detective, corrective, and recovery controls.
14.07 Determine what resources, including hardware/software, password files, source code, storage and logs, require protection.
14.08 Compare the advantages and disadvantages of internal versus external audits.
14.09 Perform compliance checks on user adherence to security policies.
14.10 Identify different types of monitoring including event, hardware, and illegal software.
14.11 Utilize monitoring tools and techniques such as trend analysis, traffic analysis and reporting mechanisms.
14.12 Implement countermeasures to defend against threats such as fraud, theft, employee sabotage, espionage, terrorism, and hackers.
14.13 Perform penetration testing activities including sniffing, eavesdropping, dumpster diving, and social engineering.
14.14 Understand principles of risk management and asset valuation.
14.15 Monitor server information for defamatory statements and privacy rights infractions.
14.16 Manage software licenses and enforce compliance within the organization.

15.0 Employ applications and systems development security techniques. The student will be able to:
15.01 Describe the stages of the system development life cycle.
15.02 Develop and document object-oriented computer programs employing structured programming techniques.
15.03 Analyze the controls that are included within systems and applications software and those used in the development of agents, applets, software, databases, data warehouses and knowledge-based systems.
15.04 Implement features to ensure data and application integrity, security and availability.
15.05 Analyze distributed environment application issues including agents, applets, and objects.
15.06 Analyze local environment application issues including viruses, Trojan horses, logic bombs and worms.
15.07 Analyze key database and data warehousing issues including aggregation, data mining, inference and poly-instantiation.
15.08 Develop multilevel security schemes for databases and data warehouses.
15.09 Compare different forms of data/information storage including primary, secondary, real, virtual, random, volatile, and sequential.

15.10 Describe different aspects of application and database security control architectures, including process isolation, hardware segmentation, separation of privilege, layering, abstraction and security kernels.

15.11 Understand the difference between supervisory and user modes of operation.

15.12 Identify various levels of application integrity including network, operating system, database, and file level integrity.

15.13 Define the various types of computer viruses and malicious code and the roles that hackers, crackers, phreaks, and virus writers play in developing and utilizing malicious code.

15.14 Formulate countermeasures to defend against or detect viruses and malicious code.

15.15 Utilize anti-virus software and develop policies to provide enterprise-wide anti-virus protection.

15.16 Employ countermeasures to defend against attacks such as brute force and replay attacks.

16.0 Develop business continuity and disaster recovery plans. The student will be able to:

16.01 Perform a business impact assessment, including components such as an emergency assessment, specifying business success and critical business functions, establishing priorities, and developing alternative means of accomplishing objectives.

16.02 Specify the necessary capabilities of alternative business sites such as cold, warm, hot and mobile sites to be used in the case of a disaster.

16.03 Develop business continuity, disaster containment, and disaster recovery plans for disasters such as such as floods, fires, power outages, strikes, hardware/software failures, and bombings addressing: protection of physical assets, emergency response, personnel notification, backups and off-site storage, utilities, external communications, and logistics and supplies.

16.04 Describe the process of performing routine scheduled maintenance of fire control systems and building utilities such as power, ventilation, and water.

16.05 Conduct a business continuity project, including scope and planning.

16.06 Develop a training program for personnel regarding business continuity/recovery plans.

17.0 Describe ethical issues, pertinent laws, and how to conduct investigations. The student will be able to:

17.01 Understand the major categories and types of laws as to how they relate to E-commerce, including criminal law, civil law and administrative law.
17.02 Develop institutional policies and practices to conform to or supplement existing laws regarding data privacy and intellectual property rights.

17.03 Describe abnormal and suspicious activity as it relates to database and e-commerce security.

17.04 Analyze potential data security threats such as fraud or collusion.

17.05 Develop legal institutional policies and practices to protect against purposeful violations of data integrity.

17.06 Identify the major categories of computer crime and attacks, including military, business, financial, terrorist, grudge and “fun” attacks.

17.07 Develop legal institutional policies and practices to conduct an investigation of purposeful violations of data integrity or existing e-commerce laws, including: the collection and preservation of evidence; confiscation of equipment, software and data; interrogation of suspected violators; and reporting of incidents to the appropriate authorities.

17.08 Discuss major ethical and legal issues related to Internet use.

18.0 Perform general organizational computing workplace competencies. The student will be able to:

18.01 Follow oral and written instructions.

18.02 Prepare, outline, and deliver a short oral presentation.

18.03 Prepare visual material to support an oral presentation.

18.04 Participate in group discussions as a member and as a leader.

18.05 Interpret appropriate information from graphics, maps, or signs.

18.06 Demonstrate self-motivation and responsibility to complete an assigned task.

18.07 List the steps in problem solving.

18.08 Identify and discuss issues contained within professional codes of conduct.

18.09 Identify and discuss intellectual property rights and licensing issues.

18.10 Identify potential sources of employee/employer or employee/employee conflict and discuss possible approaches to resolve such disagreements.

18.11 Use appropriate courtesy, manners, and dress in the workplace.

18.12 Apply principles and techniques for being a productive, contributing member of a team.

18.13 Identify and use acceptable strategies for resolving conflict in the workplace.

18.14 Apply principles and techniques for working productively with people of diverse cultures and backgrounds.

18.15 Identify techniques for stress management and prevention of job burnout.

18.16 Use appropriate communication skills, telephone etiquette, courtesy, and manners when dealing with individuals lacking a technical background.
19.0 Perform project planning and management activities. The student will be able to:
   19.01 Apply effective time management skills.
   19.02 Describe appropriate measures for planning and managing a large project.
   19.03 Define an implementation schedule for a large project.
   19.04 Describe appropriate measures for planning and implementing corporate-wide upgrade of hardware and software.
   19.05 Identify examples of effective end-user training strategies and techniques.

20.0 Perform documentation and technical reference activities. The student will be able to:
   20.01 Use technical vocabulary appropriately.
   20.02 Locate information in printed and online technical references.
   20.03 Prepare documentation to track: physical inventory, regulation and license compliance, hardware and software modifications and upgrades, security breaches and countermeasures, and the current e-commerce security environment.

21.0 Demonstrate employability skills. The student will be able to:
   21.01 Identify sources of employment opportunities.
   21.02 Discuss employer expectations regarding attendance, punctuality, initiative, teamwork, etc.
   21.03 Discuss employee rights regarding privacy, discrimination, due process, safety, etc.
   21.04 Explain the importance of a written job description.
   21.05 Identify methods for securing employment references.
   21.06 Compose a letter of application and a resume.
   21.07 Complete an employment application.
   21.08 Classify behaviors considered appropriate or inappropriate in a job interview situation.
   21.09 Demonstrate job interview skills.
   21.10 Compose a follow-up letter.
   21.11 Compose a letter of resignation.

22.0 Demonstrate professional development skills. The student will be able to:
   22.01 Discover corporate strategies and policies.
   22.02 Develop and maintain professional contacts.
   22.03 Develop mentor relationships.
   22.04 Anticipate future industry trends.
   22.05 Describe options for continuing education.
   22.06 Read industry journals and magazines.
   22.07 Attend seminars, workshops, and tradeshows.
Appendix “A”

Distance Learning References

At the time of this writing, the following web sites were found containing useful information related to the section of this framework entitled DISTANCE LEARNING DELIVERY:

ist-socrates.berkeley.edu/~fmb/articles/web_based_lms.html#V
www.siast.sk.ca/virtualcampus/infofacultystaff/testtools.htm
astro.temple.edu/~jburston/CALICO/review/webct-bb00.htm
www.c2t2.ca/landonline/sidebyside.html
www.c2t2.ca/landonline/evalapps.asp
www.sitetrainer.com/platformcomparison-easyindex.htm
www.marshall.edu/it/cit/webct/compare/comparison.html
sunil.umd.edu/webct
webct.com
blackboard.com
Appendix “B”

Distance Learning Product Comparison

The purpose of this appendix is to provide a comparison of currently available distance learning products that can be used to deliver the Database/E-Commerce Security Curriculum. This list should serve only as a guide for selecting such products, as new tools become available on a continuing basis.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Course Technology</th>
<th>NetG</th>
<th>SmartForce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price 1,000 Ids</td>
<td>$75,000</td>
<td>$36,000</td>
<td>$249,648</td>
</tr>
<tr>
<td>Web Hosting</td>
<td>Included</td>
<td>$7,500 fee</td>
<td>Included</td>
</tr>
<tr>
<td>Student Desktop</td>
<td>Windows Platform</td>
<td>Windows Platform</td>
<td>Windows Platform</td>
</tr>
<tr>
<td>56k modem min. 32 Mb RAM min.</td>
<td>28.8k modem min.</td>
<td>16 Mb RAM min.</td>
<td>28.8k modem min. 16 Mb RAM min.</td>
</tr>
<tr>
<td>Hosted web site personalization</td>
<td>Yes</td>
<td>$7,500 per school for customized separate site</td>
<td>Yes</td>
</tr>
<tr>
<td>Library Titles</td>
<td>250</td>
<td>1,000</td>
<td>300</td>
</tr>
<tr>
<td>Courses available in languages other than English</td>
<td>No</td>
<td>Over 300 courses available in Spanish, French, German</td>
<td>Part of library available in Spanish, French, German</td>
</tr>
<tr>
<td>Mentoring</td>
<td>No</td>
<td>Yes. $10,800 for 1000 users 24 X 7</td>
<td>Yes</td>
</tr>
<tr>
<td>Non-credit use</td>
<td>No</td>
<td>Yes, for continuing education</td>
<td>No</td>
</tr>
<tr>
<td>Customer support</td>
<td>Staff Only</td>
<td>24 X 7</td>
<td>Staff Only</td>
</tr>
<tr>
<td>Skills assessment</td>
<td>Simulated Pre &amp; post skills assessment; course content mapped to individual learner needs.</td>
<td>Pre &amp; post skills assessment; course content mapped to individual learner needs.</td>
<td>Pre &amp; post skills assessment; course content mapped to individual learner needs.</td>
</tr>
</tbody>
</table>
# Course Technology Catalog (Online Courses)

<table>
<thead>
<tr>
<th>Skills Area</th>
<th>Courses / Training Modules Offered</th>
</tr>
</thead>
</table>
| Illustrated Titles | Access 2000 - Complete  
Access 2000 - 2nd Course  
Access 2000 - Introductory  
Access 2000 - Brief  
Adobe Illustrator 9 - Introductory  
Computer Concepts, 3e - Introductory  
Computer Concepts, 3e - Brief  
E-Commerce Concepts - Introductory  
Excel 2000 - Complete  
Excel 2000 - 2nd Course  
Excel 2000 - Introductory  
Excel 2000 - Brief  
HTML, 2e - Complete  
HTML, 2e - Introductory  
HTML, 2e - Brief  
Office 2000 - Enhanced  
Office 2000 - Introductory  
Office 2000 - 2nd Course  
Windows 98 - Brief  
Outlook - Essentials  
Internet Explorer 5 - Essentials  
Publisher - Essentials  
Front Page 2000 - Essentials  
Adobe PhotoShop 5.5 - Introductory  
PowerPoint 2000 - Introductory  
PowerPoint 2000 - Brief  
PowerPoint 2000 - MOUS Course  
Windows 2000 - Essentials  
Word 2000 - Complete  
Word 2000 - Introductory  
Word 2000 - 2nd Course  
Word 2000 - Brief  |
| MIS Titles     | Business Data Communications  
Electronic Commerce (Schneider/Perry)  
Information Technology Project Management  
Management Information Systems  
Principles of Information Systems, 5e  
Systems Analysis and Design in a Changing World |
## Course Technology Catalog (Online Courses) - Continued

<table>
<thead>
<tr>
<th>Skills Area</th>
<th>Courses / Training Modules Offered</th>
</tr>
</thead>
</table>
| Networking / PC    | CCNA Guide to Cisco Networking Fundamentals  
| Repair Titles      | Enhanced A+ Guide to M&M Your PC, 3e - Comprehensive  
|                    | A+ Guide to Managing & Maintaining Your PC, 2e - Comprehensive  
|                    | A+ Guide to Managing & Maintaining Your PC - Introductory  
|                    | CCNA Guide to Cisco Routing  
|                    | Guide to Networking Essentials, 2e  
|                    | Guide to Wireless LANs  
|                    | I-Net+ Guide to Internet Technologies  
|                    | MCSE - Guide to Windows 2000 Professional  
|                    | MCSE - Guide to Windows 2000 Server  
|                    | Net+ Guide to Networks  
| New Perspectives   | Access 2000 - Comprehensive  
| Titles             | Access 2000 - Introductory  
|                    | Access 2000 - Brief  
|                    | Computer Concepts, 4e - Comprehensive  
|                    | Computer Concepts, 4e - Introductory  
|                    | Computer Concepts, 4e - Brief  
|                    | Creating Web Pages w/ HTML, 2e - Comprehensive  
|                    | Creating Web Pages w/ HTML, 2e - Introductory  
|                    | Creating Web Pages w/ HTML, 2e - Brief  
|                    | E-Commerce - Introductory  
|                    | E-Commerce - Brief  
|                    | Excel 2000 - Comprehensive  
|                    | Excel 2000 - Introductory  
|                    | Excel 2000 - Brief  
|                    | Front Page 2000 - Comprehensive  
|                    | Front Page 2000 - Introductory  
|                    | Internet, 2e - Comprehensive  
|                    | Internet, 2e - Introductory  
|                    | Internet, 2e - Brief  
|                    | Microsoft MS-DOS - Comprehensive  
|                    | Microsoft MS-DOS - Brief  
|                    | Office 2000 Professional - Introductory  
|                    | Office 2000 - 2nd Course  
|                    | Office 2000 - 3rd Course  
|                    | Windows 98 - Brief  
|                    | Outlook 2000 - Introductory  
|                    | PowerPoint 2000 - Comprehensive  
|                    | PowerPoint 2000 - Introductory  
|                    | PowerPoint 2000 - Brief  
|                    | Practical Office 2000  
|                    | Practical Internet  
|                    | Practical PC, 2e  
|                    | Word 2000 - Comprehensive  
|                    | Word 2000 - Introductory  
|                    | Word 2000 - Brief  
|
## Course Technology Catalog (Online Courses) - Continued

<table>
<thead>
<tr>
<th>Skills Area</th>
<th>Courses / Training Modules Offered</th>
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<tbody>
<tr>
<td><strong>Programming / Web Warriors</strong></td>
<td>Active Server Pages</td>
</tr>
<tr>
<td><strong>Titles</strong></td>
<td>Database-Driven Web Sites</td>
</tr>
<tr>
<td></td>
<td>A Guide to Programming Logic and Design</td>
</tr>
<tr>
<td></td>
<td>Internet Programming w VBScript &amp; JavaScript</td>
</tr>
<tr>
<td></td>
<td>Introduction to Programming w C++, 2e</td>
</tr>
<tr>
<td></td>
<td>Java Programming - Comprehensive</td>
</tr>
<tr>
<td></td>
<td>Java Programming - Introductory</td>
</tr>
<tr>
<td></td>
<td>Java Programming with J++ - Comprehensive</td>
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<tr>
<td></td>
<td>Java Programming with J++ - Introductory</td>
</tr>
<tr>
<td></td>
<td>JavaScript Comprehensive</td>
</tr>
<tr>
<td></td>
<td>Object-Oriented Programming Using C++, 2e</td>
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<tr>
<td></td>
<td>Programming with Microsoft Visual Basic 6 (Zak)</td>
</tr>
<tr>
<td></td>
<td>Visual Basic for Applications 6 - Enhanced</td>
</tr>
<tr>
<td></td>
<td>Visual Basic for Applications 6 (VBA)</td>
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<tr>
<td></td>
<td>Visual C++ 6.0</td>
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<tr>
<td><strong>Shelly / Cashman</strong></td>
<td>Access 2000 - Comprehensive</td>
</tr>
<tr>
<td><strong>Titles</strong></td>
<td>Access 2000 - Complete</td>
</tr>
<tr>
<td></td>
<td>Access 2000 - Introductory</td>
</tr>
<tr>
<td></td>
<td>Discovering Computers 2002 - Complete</td>
</tr>
<tr>
<td></td>
<td>Discovering Computers 2002 - Introductory</td>
</tr>
<tr>
<td></td>
<td>Discovering Computers 2002 - Brief</td>
</tr>
<tr>
<td></td>
<td>Discovering Computers 2001 - Complete</td>
</tr>
<tr>
<td></td>
<td>Discovering Computers 2001 - Brief</td>
</tr>
<tr>
<td></td>
<td>Excel 2000 - Comprehensive</td>
</tr>
<tr>
<td></td>
<td>Excel 2000 - Complete C&amp;T</td>
</tr>
<tr>
<td></td>
<td>Excel 2000 - Introductory C&amp;T</td>
</tr>
<tr>
<td></td>
<td>Office 2000 - Introductory C&amp;T</td>
</tr>
<tr>
<td></td>
<td>Office 2000 - Post-Advanced</td>
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<tr>
<td></td>
<td>Office 2000 - Advanced C&amp;T</td>
</tr>
<tr>
<td></td>
<td>Office 2000 - Brief C&amp;T</td>
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<td></td>
<td>Office 2000 - Essential C&amp;T</td>
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<td></td>
<td>PowerPoint 2000 - Comprehensive C&amp;T</td>
</tr>
<tr>
<td></td>
<td>PowerPoint 2000 - Complete Concepts &amp; Techniques</td>
</tr>
<tr>
<td></td>
<td>PowerPoint 2000 - Introductory C&amp;T</td>
</tr>
<tr>
<td></td>
<td>Systems Analysis and Design, 4e</td>
</tr>
<tr>
<td></td>
<td>Visual Basic 6 - Introductory C&amp;T</td>
</tr>
<tr>
<td></td>
<td>Windows 98 Essential Concepts &amp; Techniques</td>
</tr>
<tr>
<td></td>
<td>Word 2000 - Comprehensive C&amp;T</td>
</tr>
<tr>
<td></td>
<td>Word 2000 - Complete C&amp;T</td>
</tr>
<tr>
<td></td>
<td>Word 2000 - Introductory Concepts and Techniques</td>
</tr>
<tr>
<td><strong>Southwestern Titles</strong></td>
<td>Fundamentals of C++ Introductory, 2e</td>
</tr>
<tr>
<td></td>
<td>Mastering &amp; Using Access 2000 Updated - Comprehensive</td>
</tr>
<tr>
<td></td>
<td>Mastering &amp; Using Excel 2000 - Comprehensive</td>
</tr>
<tr>
<td></td>
<td>Mastering &amp; Using PowerPoint 2000 - Comprehensive</td>
</tr>
<tr>
<td></td>
<td>Mastering &amp; Using Microsoft Word 2000 - Comprehensive</td>
</tr>
<tr>
<td></td>
<td>Office Tutorial Series (Pasewarks)</td>
</tr>
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## NetG Catalog

<table>
<thead>
<tr>
<th>Skills Area</th>
<th>Courses / Training Modules Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business and Professional Development</strong></td>
<td>Accounting and Finance Curriculum (6)</td>
</tr>
<tr>
<td></td>
<td>Communication Curriculum (17)</td>
</tr>
<tr>
<td></td>
<td>Customer Service Curriculum (9)</td>
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<tr>
<td></td>
<td>Human Resources Curriculum (12)</td>
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<td></td>
<td>International Business Curriculum (3)</td>
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<tr>
<td></td>
<td>Leadership Curriculum (11)</td>
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<tr>
<td></td>
<td>Management Curriculum (30)</td>
</tr>
<tr>
<td></td>
<td>Personal Development Curriculum (14)</td>
</tr>
<tr>
<td></td>
<td>Project Management Curriculum (11)</td>
</tr>
<tr>
<td></td>
<td>Sales Curriculum (6)</td>
</tr>
<tr>
<td></td>
<td>Strategic Planning Curriculum (2)</td>
</tr>
<tr>
<td></td>
<td>Team Building Curriculum (11)</td>
</tr>
</tbody>
</table>

| **Desktop**                                | Databases (1)                                                                                     |
|                                            | Desktop Publishing and Graphics (1)                                                              |
|                                            | Groupware Communications (1)                                                                    |
|                                            | Internet (6)                                                                                    |
|                                            | Lotus (12)                                                                                       |
|                                            | Microsoft Office 2000 (29)                                                                       |
|                                            | Microsoft Office 95 (8)                                                                          |
|                                            | Microsoft Office 97 (18)                                                                        |
|                                            | Microsoft Office 98 (10)                                                                        |
|                                            | Microsoft Office XP (2)                                                                         |
|                                            | Novell (3)                                                                                       |
|                                            | PC Basics and Operating Systems (12)                                                              |
|                                            | SAP (81)                                                                                         |
|                                            | Spreadsheets (1)                                                                                |
|                                            | Word Processing Applications (4)                                                                  |

21
## NetG Catalog - Continued

<table>
<thead>
<tr>
<th>Skills Area</th>
<th>Courses / Training Modules Offered</th>
</tr>
</thead>
</table>
| Information Technology | C and C++ Languages (27)  
Cisco (53)  
Client/Server Development Tools (20)  
Client/Server Relational Databases (60)  
Communications and Networks (14)  
CompTIA (14)  
Distributed Architectures (7)  
Groupware/Workgroup Server Software (37)  
IBM (7)  
Implementing Solution Architectures (12)  
Linux (17)  
Lotus (34)  
Mainframe (103)  
MCDBA Certification (1)  
MCSE Certification (4)  
Microsoft BizTalk (5)  
Microsoft Internet Security and Acceleration (ISA) Server 2000 (1)  
Microsoft Windows (4)  
Microsoft Windows 2000 (60)  
Microsoft Windows Application Development (1)  
Microsoft Windows Support (38)  
Networking/Communications (9)  
Novell NetWare (38)  
Object-Oriented Technologies (5)  
Oracle (85)  
Oracle Applications R11i (4)  
SAP (3)  
Software Training (1)  
Systems Analysis (5)  
UNIX (18) |
| Internet/Intranet    | CIW (30)  
CIW Master Administrator (2)  
CompTIA (5)  
Internet/Intranet (98) |
| Software             | Software Products (3) |
# SmartForce Catalog

<table>
<thead>
<tr>
<th>Skills Area</th>
<th>Courses / Training Modules Offered</th>
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</table>
| Interpersonal Skills | Conflict Management  
                          | Decision-making  
                          | **Leadership**  
                          | Personal Management  
                          | Teamwork  
                          | Customer Service  
                          | Interviewing and Hiring  
                          | Legal Issues in Management  
                          | Sexual Harassment  
                          | Communications |
| Technology Skills              | Information Technology Core Concepts  
                          | NetObjects  
                          | Project Management  
                          | Netscape  
                          | Technical Support  
                          | Novell  
                          | Internet Security  
                          | Oracle  
                          | E-commerce  
                          | Rational  
                          | Cisco  
                          | SAP  
                          | IBM  
                          | Sybase  
                          | Java  
                          | C/C++  
                          | INFORMIX  
                          | Internet and Intranet Skills  
                          | Intel  
                          | Internetworking  
                          | Lotus  
                          | Linux  
                          | UNIX  
<pre><code>                      | Microsoft |
</code></pre>
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<th>Skills Area</th>
<th>Courses / Training Modules Offered</th>
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<tr>
<td>Business Skills</td>
<td>Business Fundamentals</td>
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<td>Business Law and Contracts</td>
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<td>Business Strategy</td>
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<td>CRM</td>
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<tr>
<td></td>
<td>Finance and Accounting</td>
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<td><strong>Information Technology</strong></td>
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<td>People Management</td>
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<td>Production Operations</td>
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<td>Project Management</td>
</tr>
<tr>
<td></td>
<td>Sales</td>
</tr>
<tr>
<td>E-business</td>
<td>E-Business Solutions</td>
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<tr>
<td></td>
<td>E-Business Technology</td>
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<tr>
<td>Home and Personal</td>
<td>Home User: Home and Personal Finance</td>
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<tr>
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<td>Home User: Office</td>
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<td>Home User: PC Maintenance</td>
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<td>Home User: Web Power</td>
</tr>
<tr>
<td>Certification</td>
<td>Cisco</td>
</tr>
<tr>
<td></td>
<td>Microsoft</td>
</tr>
<tr>
<td></td>
<td>CompTIA</td>
</tr>
<tr>
<td></td>
<td>Novell</td>
</tr>
<tr>
<td></td>
<td>IBM</td>
</tr>
<tr>
<td></td>
<td>Oracle</td>
</tr>
<tr>
<td></td>
<td>Java</td>
</tr>
<tr>
<td></td>
<td>Project Management</td>
</tr>
<tr>
<td></td>
<td>Lotus</td>
</tr>
<tr>
<td></td>
<td>Sybase</td>
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<tr>
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<td>Avaya</td>
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<td>Lucent</td>
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</table>
# Appendix “C”

## Mapping of Framework Outcomes to Distance Learning Modules

<table>
<thead>
<tr>
<th>Framework Outcome</th>
<th>Course Technology</th>
<th>NetG</th>
<th>SmartForce</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computer / Networking Core</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrate proficiency with Internet structure, organization, and navigation.</td>
<td>Office 2000…, I-Net+ Guide…, Internet…, Practical Internet</td>
<td>Internet</td>
<td>Netscape, Internet and Intranet Skills</td>
</tr>
<tr>
<td>Describe cryptography concepts, standards, and applications.</td>
<td>Electronic Commerce, Business Data Communications</td>
<td>Communications and Networks Internet/Intranet, CIW, E-commerce</td>
<td>Internet Security, E-commerce</td>
</tr>
<tr>
<td>Perform telecommunications and network security activities.</td>
<td>I-Net+ Guide…, Net+ Guide…</td>
<td>Communications and Networks Internet/Intranet, CIW, CompTIA</td>
<td>Internet Security, CompTIA</td>
</tr>
<tr>
<td><strong>Database Core</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform administrative tasks related to database security.</td>
<td>Database-driven Web Sites</td>
<td>Client/Server Relational Databases, Oracle, MCDBA</td>
<td>Oracle</td>
</tr>
<tr>
<td>Framework Outcome</td>
<td>Course Technology</td>
<td>NetG</td>
<td>SmartForce</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------</td>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>E-commerce Core</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform tasks related to e-commerce security.</td>
<td>Electronic Commerce, Database-driven Web Sites</td>
<td>CIW Master Administrator</td>
<td>E-commerce, Internet Security</td>
</tr>
<tr>
<td><strong>Operations Core</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design and implement physical security measures.</td>
<td>Net+ Guide…</td>
<td>Internet/Intranet, Communications and Networks</td>
<td>Internetworking, Internet Security</td>
</tr>
<tr>
<td>Develop business continuity and disaster recovery plans.</td>
<td>Information Technology…, Principles of IS</td>
<td>Strategic Planning</td>
<td>Internet Security, Business Strategy, Production Operations</td>
</tr>
<tr>
<td>Describe ethical issues, pertinent laws, and how to conduct investigations.</td>
<td>NA</td>
<td>Human Resources, Management</td>
<td>Legal Issues in Management, Business Law and Contracts, People Management</td>
</tr>
<tr>
<td>Framework Outcome</td>
<td>Course Technology</td>
<td>NetG</td>
<td>SmartForce</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>Professional Core</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform project planning and management activities.</td>
<td>Information Technology Project Management, Systems Analysis…</td>
<td>Management, Project Management, Strategic Planning</td>
<td>Decision-making, Interviewing and Hiring, People Management, Production Operations, Project Management</td>
</tr>
<tr>
<td>Perform documentation and technical reference activities.</td>
<td>Systems Analysis…</td>
<td>Systems Analysis</td>
<td>Technical Support</td>
</tr>
<tr>
<td>Demonstrate employability skills.</td>
<td>NA</td>
<td>Communication, Leadership, Personal Development, Team Building</td>
<td>Leadership, Personal Management, Teamwork, Communications</td>
</tr>
<tr>
<td>Demonstrate professional development skills.</td>
<td>NA</td>
<td>Communication, Leadership, Personal Development, Team Building</td>
<td>Leadership, Personal Management, Teamwork, Communications</td>
</tr>
</tbody>
</table>
Appendix “D”

Hardware / Software Requirements for the Database / E-commerce AS Degree Program.

The specifications below are based on outfitting a classroom consisting of 20 student workstations, 1 instructor workstation, and 2 classroom servers. Recognizing that many institutions already have resources in place that could be adapted to this program, this budget assumes that the proper physical environment for a computer classroom exists including tables, chairs, projector system, whiteboard, etc.

The budget costs represent estimates of average industry pricing as of October of 2001.

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Item</th>
<th>Description</th>
<th>Approximate Unit Price</th>
<th>Total Cost</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Software</td>
<td>MSDN Academic Alliance Subscription</td>
<td>$799.00</td>
<td>$799.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Membership is limited to departments within a qualified not-for-profit, accredited educational institution in the US and Publicly-funded schools in Canada. The membership includes all Microsoft developer tools, platforms, and servers for instructional and research purposes. $799 (USD) annual membership fee per department. Membership runs from July 1-June 30. For more information, please go to <a href="http://www.msdnaa.net">www.msdnaa.net</a>. Software includes, Host Integration Server, Mobile Information Server, SharePoint Portal Server, Visual Studio, and Visio.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Network Operating System</td>
<td>Windows Server and Professional is included in the Microsoft MSDN Academic Alliance Subscription.</td>
<td>$30.00</td>
<td>$690.00</td>
</tr>
<tr>
<td>23</td>
<td>Database Server Software</td>
<td>SQL Server is included in the Microsoft MSDN Academic Alliance Subscription.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>E-commerce Software</td>
<td>Commerce Server and BizTalk Server are included in the Microsoft MSDN Academic Alliance Subscription.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Email Server Software</td>
<td>Exchange Server is included in the Microsoft MSDN Academic Alliance Subscription.</td>
<td></td>
<td></td>
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<tr>
<td>23</td>
<td>Web Server Software</td>
<td>Internet Information Server and Application Center are included in the Microsoft MSDN Academic Alliance Subscription.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Firewall / VPN Software</td>
<td>Internet Security and Acceleration Server is included in the Microsoft MSDN Academic Alliance Subscription.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Web Analysis Software</td>
<td>Internet Information Server, Systems Management Server, and Performance Monitor are included in the Windows Server Software.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Network Monitor Software</td>
<td>Network Monitor is included in the Windows Server Software.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Web Browser and FTP Client Software</td>
<td>Microsoft Internet Explorer is included in the Windows Operating System Software.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Network Operating System</td>
<td>Price based on Red Hat Linux</td>
<td>$30.00</td>
<td>$690.00</td>
</tr>
<tr>
<td>23</td>
<td>Network Operating System</td>
<td>NETWARE 5 ADMIN V1.01 SELF STUDY Kit including OS software and license</td>
<td>$500.00</td>
<td>$11,500.00</td>
</tr>
<tr>
<td>23</td>
<td>Anti-Virus Software</td>
<td>Virus detection software, McAfee or Norton</td>
<td>$20.00</td>
<td>$460.00</td>
</tr>
</tbody>
</table>
## Database / E-Commerce Security Frameworks

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Software Cost</th>
<th>Hardware Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office Software including Web Authoring Software, Database and Email Clients</td>
<td>21</td>
<td>Microsoft Office 2000 or XP Professional containing Microsoft Word, Excel, Access, PowerPoint, FrontPage, and Outlook.</td>
<td>$200.00</td>
</tr>
<tr>
<td>Firewall / VPN Software</td>
<td>5</td>
<td>Raptor Firewall / VPN software 25 user license</td>
<td>$1,800.00</td>
</tr>
<tr>
<td>Backup Software</td>
<td>1</td>
<td>Backup Exec for Windows NT/2000</td>
<td>$475.00</td>
</tr>
<tr>
<td>Web Server Software</td>
<td>23</td>
<td>Apache Web Server for Linux is freeware available on the Internet for download.</td>
<td>Freeware or Shareware Software available on the Internet for download.</td>
</tr>
</tbody>
</table>

### Subtotal for Software Expenditures

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Software Cost</th>
<th>Hardware Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workstation</td>
<td>23</td>
<td>High-end computer system capable of running current Operating Systems from Microsoft, Novell, Linux, etc. Includes: cdrom, cdrw, monitor, keyboard, mouse, NIC, sound card, video card, etc. (20 student workstations, 1 instructor workstation, and 2 classroom servers)</td>
<td>$1,500.00</td>
</tr>
<tr>
<td>Hard Drive</td>
<td>21</td>
<td>When teaching the Microsoft, Novell, and Linux/Unix courses, it would be advisable to use a separate set of hard drives for students to install the operating systems and practice administrative tasks without disrupting other classroom computer configurations. Only one set of secondary hard drives is specified here. Your institution may need to purchase additional sets depending on course scheduling and the number of concurrent courses being taught.</td>
<td>$150.00</td>
</tr>
<tr>
<td>Removable Mobile Rack for Hard Drive</td>
<td>42</td>
<td>Removable Frame for 3.5&quot; Hard Drive. Note: Need one rack for each computer's original drive plus one rack for each additional networking drive.</td>
<td>$22.00</td>
</tr>
<tr>
<td>Tape Drive w/ SCSI Controller</td>
<td>1</td>
<td>Tape Backup Drive and SCSI Controller for server</td>
<td>$700.00</td>
</tr>
<tr>
<td>Proxy Server Appliance</td>
<td>1</td>
<td></td>
<td>$500.00</td>
</tr>
<tr>
<td>VPN Router</td>
<td>1</td>
<td>CISCO - DUAL-ETHERNET SECURITY ACCESS ROUTER, VPN and Clients</td>
<td>$1,200.00</td>
</tr>
<tr>
<td>Technicians Tool Kit</td>
<td>10</td>
<td>Tool kit including screwdrivers, wire cutter / stripper, needle-nose pliers, and nut drivers.</td>
<td>$70.00</td>
</tr>
<tr>
<td>RJ11/RJ45 Crimper Set</td>
<td>10</td>
<td></td>
<td>$50.00</td>
</tr>
<tr>
<td>Cable Testers</td>
<td>5</td>
<td>Must be capable of testing Cat 5 cable.</td>
<td>$40.00</td>
</tr>
<tr>
<td>RJ45 Connectors</td>
<td>1</td>
<td>Bulk 500 pack Cat 5 connector</td>
<td>$350.00</td>
</tr>
<tr>
<td>Cat 5 UTP Cable</td>
<td>2</td>
<td>1000 ft spindle.</td>
<td>$100.00</td>
</tr>
<tr>
<td>Router</td>
<td>3</td>
<td>Price for Cisco 2620 Router with one 10/100 port and two WAN interfaces</td>
<td>$1,700.00</td>
</tr>
<tr>
<td>Laser Printer</td>
<td>1</td>
<td>HP, Lexmark, etc.</td>
<td>$1,000.00</td>
</tr>
<tr>
<td>Ethernet Switch</td>
<td>3</td>
<td>Price for Cisco 2900 Series 24 port 10/100 switch</td>
<td>$1,200.00</td>
</tr>
<tr>
<td>Misc. Hardware Items</td>
<td>1</td>
<td>Cables, connectors, tools, networking components, etc.</td>
<td>$3,000.00</td>
</tr>
</tbody>
</table>

### Subtotal for Hardware Expenditures

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Software Cost</th>
<th>Hardware Cost</th>
</tr>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Subtotal for Software Expenditures** | **SUBTOTAL** | **$27,124.00** |

**Subtotal for Hardware Expenditures** | **SUBTOTAL** | **$55,624.00** |

**TOTAL** | **$82,748.00** |