SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: __PROG 109__   Department: __Information Technologies__

Course Title: __Information System Fund__   Semester: __Spring__   Year: __2005__

Objectives/Competencies

Course Objective	Competencies
1. Describe and use basic computer and Internet technologies effectively.	1.1. Define the term "computer" and identify the components of a personal computer system 1.2. Compare the following computer capabilities of the following computer categories: personal computers, handheld computers, workststations, video game consoles, mainframe computers, super computers, and servers 1.3. Explain how an operating system affects compatibility between computer platforms, such as PCs and Macs 1.4. Evaluate the various ways you can connect a computer to the Internet and select an ISP 1.5. Describe how Web servers, URLs, HTML, HTTP, and browsers contribute to the Internet resource known as the Web 1.6. Describe popular Internet resources, such as Web, e-mail, bulletin boards, blogs, file downloads, file sharing, Internet telephony, broadcasting, chat groups, and instant messaging 1.7. Demonstrate the use of a search engine to locate information on the Web 1.8. List the features found in a typical e-mail software package 1.9. Explain how an e-mail system works, and the difference between store-and-forward mail and Web based mail
2. Identify and describe computer hardware and software components, functions, and relationships.	2.1 Explain binary representation and why computers are digital. 2.2 Describe the role of a microprocessor's ALU, control unit, registers, and

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	instruction set
	2.3 List the factors that affect microprocessor performance
	2.4 Explain how RAM works and how it differs from disk storage
	2.5 List facts about RAM that are important to computer buyers and owners
	2.6 Describe the difference between magnetic storage and optical storage
	2.7 Use criteria such as versatility, durability, capacity, access time, and data transfer rate to compare storage technologies: floppy disks, hard disks, tapes, CDs, and DVDs
	2.8 Describe the components of a computer's expansion bus, including various types of expansion slots and cables
	2.9 Explain the differences between a CRT and an LCD monitor
	2.10 Compare and contrast the technologies and applications for ink jet, solid ink, thermal, dye sublimation, laser, and dot matrix printers
	2.11 Explain the hardware compatibility considerations, device drivers, and procedures involved in installing a peripheral device
	2.12 Describe the software components of a typical software package, including executable files, support modules, and data modules
	2.13 Trace the development of a computer program from its inception as a set of high-level language instructions through its translation into machine language
	2.14 Describe the differences between system software and application software
	2.15 Describe the way an operating system manages each computer resource
	2.16 Identify operating systems for personal computers, PDAs, and servers
	2.17 Explain the key features and uses for word processing, desktop publishing, and Web authoring software
	2.18 Describe the major features of spreadsheet software
	2.19 Describe the key features of database software
	2.20 List the types of software that are available for graphics, music, education and reference, entertainment, and business
	2.21 Explain how to install and uninstall software, whether it is supplied on CDs or as a Web download
	2.22 Describe the rights granted by copyright law, a typical commercial software license, a shareware license, a freeware license, an open source license, and public domain software.

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	2.23 Create valid names for files and folders, plus demonstrate that you can construct and trace file paths 2.24 Demonstrate how to use file management features of application software and operating system utilities 2.25 Describe how a computer physically stores data on disks, but represents this storage system with a logical model 2.26 Explain how file viruses, boot sector viruses, macro viruses, Trojan horses, worms, and Denial of Service attacks affect files and disrupt computer operations 2.27 Describe how a computer owner can use antivirus software to avoid, find, and remove viruses 2.28 Demonstrate that you can implement a viable backup and restore plan 2.29 Compare the advantages and disadvantages of using tapes, floppy disks, a second hard disk, CDs, Zip disks, networks, and Web sites for backups[i]. 2.30 Describe how information systems help organizations fulfill their missions, deal with threats, and take advantage of opportunities 2.31 Contrast and compare the characteristics of transaction processing systems, management information systems, decision support systems, and expert systems 2.32 Classify problems that reduce the effectiveness of an information system 2.33 Describe various models for the system development life cycle (SDLC), and explain the focus of the structured, information engineering, object-oriented, and rapid application development approaches to system development 2.34 List the activities that take place in each phase of the system development life cycle 2.35 Describe alternative hardware and software solutions that a project team might consider 2.36 Describe the advantages and disadvantages of direct conversion, parallel conversion, phased conversion, and pilot conversion
3. Identify and describe network types and classifications, LANs, WANS, Internet technologies, the Internet, Web Pages, Web Sites, Digital Media and E-Commerce.	3.1 Describe the characteristics of various networks, such as MANs, WANs, LANs, PANs, HomePLC, HomePNA, Ethernet, Wi-Fi, Token Ring, FDDI, client/server, and peer to-peer 3.2 List the types of cables and other links typically used for data communications networks

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	3.3 Make a list of network devices, explain the role of each one, and indicate whether they are typically used on the Internet or with LANs 3.4 Describe the role of communications protocols and list some protocols typically associated with the Internet and LANs 3.5 Explain the difference between packet switching and circuit switching technology 3.6 Briefly recount the history of the Internet 3.7 Draw a conceptual diagram illustrating the Internet backbone, NAPs, NSPs, routers, and ISPs 3.8 Explain when and why one might use Ping and Traceroute utilities 3.9 Explain the differences between permanent IP addresses, dynamic IP addresses, private IP addresses, and domain names 3.10 Describe the advantages and disadvantages of dial-up, cable modem, DSL, ISDN, T1, T3, and wireless Internet access 3.11 Explain when and why it is important to implement security measures, such as antivirus software, firewalls, and Network Address Translation 3.12 Describe the roles that HTML, XHTML, HTTP, URLs, browsers, and Web servers play in bringing Web pages to your desktop 3.13 Explain why cookies are useful in an environment that is based on a stateless protocol. 3.14 Identify some Web page design tools and discuss their advantages and their disadvantages 3.15 Describe how HTML tags, cascading style sheets, links, buttons, hot spots, frames, forms, and tables are used in the design and creation of Web pages 3.16 Identify the elements that typically form a Web page 3.17 Explain how to test and post Web pages 3.18 Create a simple web page 3.19 Describe how DHTML, XML, and XSL technologies work to enhance Web pages 3.20 List some advantages and disadvantages of using JavaScript, VBScript, Java applets, and ActiveX controls 3.21 Discuss why e-commerce has become so popular with consumers and merchants

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	3.22 List some threats to the security of credit card numbers and other sensitive data during e-commerce transactions
	3.23 Describe how the following e-commerce technologies work: shopping carts, SSL, one-time-use credit cards, electronic wallets, and person-to-person payment system
	3.24 Describe the advantages, disadvantages, and uses for digital media, such as bitmap graphics, vector graphics, 3-D graphics, 3-D animations, desktop video, waveform audio, MIDI music, speech synthesis, and speech recognition
	3.25 List the equipment and software that can be used to work with various types of digital media
	3.26 Identify digital media files by their filename extensions
	3.27 Understand the advantages and disadvantages of using each type of digital media on the Web
	3.28 Explain how resolution, image size, color depth, and color palettes can be manipulated to adjust the file size of a bitmap graphic
	3.29 Describe the procedures required to convert bitmap graphics into vectors and vector graphics into bitmaps
	3.30 Explain how wireframes, rendering, and ray tracing apply to 3-D graphics
	3.31 Define the differences between desktop video and 3-D animation
	3.32 Describe how to shoot, capture, edit, and process desktop video
	3.33 Explain how window size, frame rate, and compression affect file size for a desktop video
	3.34 Describe the process of creating an MP3 music file
4. Understand the history, current applications, careers, social issues and future trends of the computer industry.	4.1 Outline the development of calculating and computer devices, beginning with simple counting aids and continuing through developments that led to today's computer technology.
	4.2 Describe the hardware, software, and operating system characteristics for computer prototypes and the four generations of computers
	4.3 List he factors that changed personal computers from hobbyists' kits to widely used productivity and communications tools
	4.4 Describe the role of the computer and IT industries in today's global

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	economy 4.5 Explain the life cycle of typical hardware and software products 4.6 Discuss the advantages and disadvantages of various marketing channels for consumers who want to purchase computers and related products. 4.7 Describe the job outlook, working conditions, and salaries for computer professionals 4.8 Differentiate between computer engineering, computer science, and information systems degree programs 4.9 Describe the role of computer programmers and software engineers 4.10 Categorize today's popular computer programming languages by generation and paradigm 4.11 Explain the process of planning, coding, and testing a computer program 4.12 Define the term algorithm and describe how it relates to procedural programming 4.13 Identify various tools that programmers use to plan programs, such as flowcharts, structured English, pseudocode, UML diagrams, and decision tables 4.14 Follow the control structures for a procedural program. 4.15 Conduct research on a current application, future traned or social issue and present research using technology 4.16 Analyze issues such as computer recycling, the digital divide, and computer literacy.
5. Demonstrate the use of a variety of instructional, application technologies to develop critical thinking and analysis.	5.1 Create an account and utilize a course delivery system (Blackboard) 5.2 Participate in problem-solving activities F2F and online. 5.3 Demonstrate competence with hands-on labs associated with concepts. 5.4 Learn a new application using online help and tutorials to demonstrate "Learning to Learn".

* Most Competencies derived from text "Computer Concepts" 7th Edition, Parsons and Oja, ©2005 Thomson Course Technology.