



Information Technology

Pathway: Information Support and Services

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITPB01.01	Information Support & Services Pathway	#4: Introduction to Information Support and Services	Perform computer user support.	Analyze technical support needed.	Identify support requirements.
					Apply information and data analysis techniques.
					Identify skill level needs.
					Define scope of work to meet customer needs.
					Identify resources and risks.
					Evaluate present data and system configuration.
					Formulate a support plan.
				Perform customer service.	Communicate and document technical support provided.
					Provide high-level technical support.
					Respond to user questions
					Provide troubleshooting for hardware/software.
					Diagnose problems within system.
					Perform technical functions required by customer/user.
					Employ technical and computer tools to perform task in the most cost-effective manner.
					Manage working relationships with customer within support boundaries.
Balance resources against customer needs.					
Manage multiple customer requirements.					



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITPB01.02	Information Support & Services Pathway	#4: Introduction to Information Support and Services	Manage software systems.	Perform configuration management activities.	Demonstrate knowledge of identification and control functions.
					Demonstrate knowledge of version management and interface control.
					Select appropriate tools for configuration management.
					Determine standards to be applied (e.g., international, industry, military).
					Specify baseline and software life-cycle phases.
					Assess the impact of changes that affect interfaces.
					Perform work flow analysis to determine user needs.
				Evaluate application software packages.	Evaluate appropriateness of software for specific projects.
					Prepare a cost-benefit analysis for a software package.
					Document results of the software evaluation.
					Perform a software configuration audit.
					Perform a physical configuration audit.
					Develop a method for evaluation.
					Test the functionality of proposed software configuration.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITPB01.03	Information Support & Services Pathway	#5: Advanced Applications	Demonstrate and apply knowledge of web programming and hosting.	Demonstrate knowledge of Internet programming basics.	Recognize the importance of Internet programming standards.
					Demonstrate knowledge of standard Internet programming coding.
					Demonstrate knowledge of special Internet programming feature codes.
					Differentiate between various versions of Internet programming.
					Demonstrate knowledge of how to use standard programs to produce an Internet application.
					Identify authoring programs specifically designed for Internet programming production.
					Compare/contrast features, strengths, and weaknesses of different authoring programs.
					Identify cross-platform issues.
Keep up-to-date with new and emerging trends related to Internet programming.					

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Apply knowledge of basic web programming.	<p>Demonstrate knowledge of the purpose of web content delivery enablers (e.g., CGI, API, SSI).</p> <p>Demonstrate knowledge of how to interface client/server.</p> <p>Demonstrate knowledge of client-side processing and its advantages/disadvantages.</p> <p>Identify security issues related to client-side processing.</p> <p>Identify standard scripting languages (e.g., JavaScript, Visual Basic Script, ActiveX).</p> <p>Demonstrate knowledge of the uses and advantages/disadvantages of various scripting languages.</p> <p>Demonstrate knowledge of how to use a scripting language to program a site.</p> <p>Demonstrate knowledge of how to use advanced communication protocols.</p>
				Apply knowledge of web hosting.	<p>Compare the advantages and disadvantages of running your own server vs. using a server provider.</p> <p>Identify hardware requirements for a server.</p> <p>Identify server software options.</p> <p>Evaluate server providers.</p> <p>Establish a domain name.</p> <p>Comply with TCP/IP (Transfer Control Protocol/Internet Protocol).</p> <p>Upload files to the server.</p> <p>Publicize the site (e.g., submit announcements to major search engines).</p> <p>Collect/analyze usage statistics.</p>



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ITPB01.04	Information Support & Services Pathway	#8: System Installation and Maintenance	Demonstrate and apply knowledge of hardware design, operation and maintenance.	Demonstrate knowledge of CPU components.	Demonstrate knowledge of chip configuration and structure.
					Demonstrate knowledge of the functions of internal components (e.g., motherboards, co-processor boards, memory devices).
					Demonstrate knowledge of the characteristics and operation of controller and network interface cards.
					Demonstrate knowledge of circuits, logic elements and switching theory, including minimization concepts and implementation of functions.
				Install computer system (e.g., monitor, keyboard, disk drive, and printer).	Identify primary PC components and the functions of each.
					Demonstrate knowledge of how hardware components interact and how conflicts arise.
					Access needed information using manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts).
					Secure supplies and resources.
					Respond to error messages and symptoms of hardware failures.
					Install boards to support peripherals.
					Connect peripherals to CPU.
					Employ appropriate safety precautions when working with PCs.
					Configure system.
					Verify system operation.
Document system installation activities.					
Backup system configuration.					



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Troubleshoot computer systems.	Test all applications. Identify priorities and interrupts at system level. Demonstrate the use of volatile and nonvolatile memory. Repair/replace volatile and nonvolatile memory. Test system using diagnostic tools/software. Identify problems in the operating system and related hardware. Differentiate between hardware and software failure. Update flash memory (BIOS). Optimize hard drive. Gather information on problem from user. Conduct appropriate diagnostic tests. Repair/replace malfunctioning hardware. Reinstall software as needed. Recover data and/or files. Restore system to normal operating standards.



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ITPB01.05	Information Support & Services Pathway	#5: Advanced Applications	Demonstrate knowledge of programming theory.	Demonstrate knowledge of programming language concepts.	Demonstrate knowledge of the concept of physical representation of digitized information (e.g., data, text, image, voice).
					Demonstrate knowledge of the hardware-software connection.
					Demonstrate knowledge of the concepts of data and procedural representation.
					Demonstrate knowledge of the function and operation of compilers and interpreters.
					Demonstrate knowledge of the basic principles for analyzing a programming language.
					Demonstrate knowledge of the basics of structured, object-oriented, and event-driven programming.
					Demonstrate knowledge of how a programming language can support multitasking and exception-handling.
					Demonstrate knowledge of current key programming languages and the environment they are used in (e.g., C, C++, Visual Basic, Java, RPG, COBOL, Assembler).
				Demonstrate knowledge of the stages of program development.	Identify the use of program design tools.
					Demonstrate knowledge of structured/modular programming.
					Demonstrate knowledge of the information system (IS) life cycle.
				Demonstrate knowledge of technical documentation associated with software development.	Secure needed information using appropriate reference materials.
					Analyze specifications.
					Identify constraints.
					Identify input and output (I/O) requirements.



					Prepare logic using a program flowchart.
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Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITPB01.06	Information Support &	#7: Network Applications	Demonstrate knowledge of networking concepts.	Demonstrate knowledge of basic network classifications and topologies.	Interpret basic networking terminology.
					Differentiate between LANs, MANs and WANs.
					Demonstrate knowledge of how to turn LANs into MANs and WANs.
					Identify the basic point-to-point network topologies (e.g., star, ring, tree, network, irregular).
					Demonstrate knowledge of packet-switching techniques.
					Identify the basic broadcast topologies (e.g., star ring, bus).
				Demonstrate knowledge of the basics of network architecture.	Demonstrate knowledge of the characteristics and uses of network components (e.g., hub, switches, routers, firewall).
					Differentiate between a physical and logical topology.
					Demonstrate a basic knowledge of OSI modeling.
					Demonstrate knowledge of LAN transmission methods, standards and protocols.
Demonstrate knowledge of various frame types and formats.					



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			(CONTINUED)	Demonstrate knowledge of the general characteristics of network operating systems.	Identify the purposes of a network operating system (NOS). Differentiate between network operating systems and data distribution systems. Identify how the four components of a network operating system (i.e., server platform, network services software, network redirection software, communications software) support network operations. Define the criteria used to evaluate network operating systems. Identify how protocols are supported. Identify licensing requirements. Demonstrate knowledge of the characteristics of the client/server models. Analyze the advantages and disadvantages of the client/server model. Demonstrate knowledge of a typical program function call. Identify the properties of open systems. Demonstrate knowledge of LAN connectivity issues.



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			(CONTINUED)	Demonstrate knowledge of network applications.	Demonstrate knowledge of how disk storage is shared across a network.
					Demonstrate knowledge of how processing power is shared across a network.
					Demonstrate knowledge of application-specific servers (e.g., database, print, communications, terminal, fax, security).
					Identify the advantages of sharing backup and management of PCs across a network.
					Identify software licensing requirements and categories.



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ITPB01.07	Information Support & Services Pathway	#7: Network Applications	Demonstrate knowledge of application development lifecycle.	Conduct needs analysis.	Define business problem to be solved by the application (e.g., through interview process).
					Identify scope of project.
					Access needed information using company procedural manuals, references, documentation, and standards.
					Define business information requirements.
					Align information system (IS) design with the business process.
					Determine hardware and software needs.
					Interpret source data, charts, and graphs.
					Review organizational structure.
					Interpret existing operating documents and procedures for the system.
					Observe existing procedures.
					Document existing procedures.
					Document possible alternative solutions.
					Identify processing requirements.
					Define variables.
Analyze specifications.					
Present findings and recommendations to users and management (e.g., work plan, project estimate).					

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITPB01.08	Information Support & Services Pathway	#4: Introduction to Information Support and Services	Demonstrate and apply knowledge of Information System Analysis and Design	Initiate a system project.	Identify the phases in a system project.
					Select basic fact-gathering techniques to be used.
					Define the scope of the systems project.
				Evaluate applications within the information system.	Conduct a preliminary investigation.
					Design a framework for evaluating information system functions.
					Design a framework for evaluating individual applications.
Recommend new features or enhancements to existing tools.					
ITPB01.09	Information Support & Services Pathway	#8: System Installation and Maintenance	Demonstrate and apply knowledge of System Installation and Maintenance.	Apply knowledge of the life cycle of an information system.	Research the concept of information system life cycles.
					Manage backup and recovery, both on- and off-site.
				Implement recovery procedures as needed.	
				Troubleshoot problems.	Demonstrate knowledge of basic troubleshooting steps.
					Minimize impact of problems on productivity (e.g., minimize downtime).
				Evaluate problem-solving processes and outcomes.	Evaluate problem-solving outcomes to determine whether the problem was solved as intended.
					Evaluate whether the process was applied in an efficient and responsible manner.
					Assess the validity and usefulness of the outcomes.



					Determine needed follow-up actions.
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Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITPB01.10	Information Support & Services Pathway	#8: System Installation and Maintenance	Demonstrate knowledge of System Administration and Control.	Perform general system administration tasks.	Facilitate the delivery of technical services.
					Set up/maintain user accounts on multiple systems.
					Participate in the evaluation, analysis, and recommendation of technical computing products.
					Document performance problems.
					Prepare required reports.
					Maintain technical industry knowledge.
ITPB01.11	Information Support & Services Pathway	#8: System Installation and Maintenance	Demonstrate and apply knowledge of Project Management.	Define scope of work to achieve individual and group goals.	Assess the task's contribution to overall business needs.
					Identify size and specifics of the task.
					Formulate task sequence.
					Plan multiple tasks simultaneously.
					Identify potential problems.
					Develop contingency plans.
				Manage information system project methodologies.	Define the project's contribution to business needs.
					Define the scope of the project.
					Identify stakeholders and decision makers.
					Identify escalation procedures.
					Develop task list (work breakdown structures).
					Evaluate project requirements.
					Identify required resources and budget.
					Estimate time requirements.
					Develop initial project management flowchart.



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			(CONTINUED)		Identify interdependencies.
					Identify critical milestones.
					Evaluate risks.
					Prepare contingency plan.
					Manage the change control process.
					Track critical milestones.
					Participate in project phase review.
					Report project status.
					Utilize project management software.
					Develop a method of evaluation.
				Develop time and activity plan to achieve objective.	Coordinate plan with team, cross-functional groups, or individuals.
					Formulate a task strategy.
					Prioritize tasks according to business needs.
					Manage multiple tasks simultaneously.
					Devise plan of action.
ITPB01.12	Information Support & Services Pathway	#6: Communications in Information Technology	Demonstrate and apply knowledge of Technical Writing and Documentation.	Evaluate technical writing requirements.	Define/prioritize communication needs.
					Specify project objectives.
					Determine the size and specifics of the work to be completed.
					Estimate time, materials, and capabilities needed to complete assignment.
					Evaluate strengths and weaknesses of completed project.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Conduct technical research.	Identify target audience.
					Define research questions.
					Determine priorities for the information that should be gathered.
					Identify potential sources of information.
					Target audience/user group as a key information source.
					Identify subject-matter experts.
					Evaluate potential sources of information based on established criteria (e.g., affordability, relevance).
					Conduct interviews with selected human information sources.
					Gather information from selected print and electronic sources.
					Determine the accuracy and completeness of the information gathered.
				Design technical documentation.	Define purpose of documentation.
					Specify standards for documentation, including critical success criteria.
					Identify delivery options.
					Evaluate cost-effectiveness of each delivery option.
					Select tools appropriate for task purpose.
					Plan information flow.
					Select writing style and tone appropriate for given documentation.
					Determine level of detail needed.
					Identify visuals appropriate for given documentation.
					Provide feedback on design to development team/individual.

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Write technical reports.	Determine audience. Access needed information using standard references and sources. Identify type of report needed. Compile relevant data. Organize data into charts and graphs. Analyze data. Draw conclusions from data analysis. Outline report. Draft report. Edit report (e.g., check spelling, grammar, punctuation, sentence structure, accuracy of content). Review report with peers. Revise report as needed based on peer feedback. Proofread revised report. Present reports.
ITPB01.13	Information Support & Services Pathway	#7: Network Applications	Understand and implement Quality Assurance processes.	Employ quality tools. Apply knowledge of quality cost implications.	Demonstrate knowledge of the characteristics and functions of available quality tools. Select quality tool(s) appropriate to situation. Establish cost/quality objectives. Classify costs (e.g., direct and indirect, fixed and variable, methods and standards). Classify quality costs (e.g., prevention, evaluation, pre-delivery failure, post-delivery failure). Interpret quality cost reports. Establish guidelines for liability prevention. Identify safety terms of product.



					Identify safety responsibility within organization.
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