



Information Technology

Foundation

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC01.01	Academic Foundations	Language Arts Courses	Demonstrate language arts knowledge and skills required to pursue the full-range of career and post-secondary education opportunities within the IT career cluster.	Listen actively.	
				Adapt language (diction/structure, style) for audience, purpose, situation.	
				Collect/organize oral and written information.	
				Compose/edit (agenda, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, technical terminology).	
				Comprehend oral and written information (cause/effect, comparisons/contrasts, conclusions, context, purpose, charts/tables/graphs, evaluation/critiques, mood, persuasive text, sequence, summaries, technical matter).	
Evaluate oral and written information (accuracy, adequacy/sufficiency, appropriateness, clarity, conclusions/solutions, fact/opinion, propaganda, relevancy, validity, relationship of ideas).					



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			(CONTINUED)	Identify oral and written assumptions, purpose, outcomes/solutions, and propaganda techniques. Predict outcomes/solutions from oral and written information trends. Present formal and informal speech for the purposes of discussion, supplying/requesting information, interpretation, and persuasion. Use library, text and Internet resources.	
ITC01.02	Academic Foundations	Mathematics Courses	Demonstrate mathematics knowledge and skills required to pursue the full range of career and post-secondary education opportunities within the IT career cluster.	Identify whole numbers, decimals, fractions, complex numbers, polynomials, and geometrical figures. Apply basic arithmetic (addition, subtraction, multiplication, and division) Apply relational (equal, not equal, greater than, less than, etc.) and logical operators in a logical expression. Understand the relationship of data and measurements to the problem. Produce mathematical formulae, expressions, and/or sequence of solution steps from problem statements. Analyze problem statements for missing/irrelevant data, estimate/exact values, inconsistent parameters. Construct charts/tables/graphs from functions and data. Describe problem-solving techniques (e.g., successive approximation, trial and error).	



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ITC01.03	Academic Foundations	Science Courses	Demonstrate science knowledge and skills required to pursue the full range of career and post-secondary education opportunities within the IT career cluster.	Analyze/evaluate conclusions, conflicting data, controls, data, inferences, limitations, questions, sources of errors, and variables.	
				Use computers for information processing, mathematical applications and problem-solving.	
				Apply/use scientific methods in qualitative and quantitative analysis, data gathering, direct and indirect observation, predictions, and problem identification.	



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ITC02.01	Communications	Language Arts Courses	Comprehend and use reading strategies to learn meaning, technical concepts, vocabulary, and follow instructions.	Determine and use reading strategy (skimming, reading for detail, reading for meaning and critical analysis) to determine purpose of text.	Use reading strategy to achieve intended purpose.
					Identify purpose of text.
					Identify complexity of text.
				Analyze information and read to learn meaning, technical concepts, vocabulary, and follow directions.	Explain purpose of text.
					Determine relevance, accuracy and appropriateness to purpose.
					Identify complexities and discrepancies in information.
					Analyze information presented in a variety of formats, such as tables, lists, figures.
				Interpret, transcribe and communicate information, data, and observations to apply information learned from reading to actual practice.	Identify key technical concepts and vocabulary.
					Follow all instructions as specifically given.
					Explain meaning of new terms, vocabulary and concepts.
					Interpret technical materials used.
					Summarize overall meaning of text.
					Write specific steps for applying information to task or new situation.
					Write set of directions for others sharing information learned and applying that to task or new situation.



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ITC02.02	Communications	Language Arts Courses	Locate, organize and reference written information from various sources to communicate with co-workers and clients/participants.	Locate written information to communicate with co-workers and clients/participants.	Identify topic.
					Conduct search of information using card catalog, keywords, and/or search engines.
					Locate variety of resources such as books, journals, and magazines.
					Locate information from electronic forms including the Internet.
				Organize information to use in written and oral communications.	Organize resources to use key information.
					Read and take notes from selected resources.
					Prepare outline that emphasizes major points with supporting data.
					Present information in organized, easy-to-follow manner.
				Document the source and proper reference for written information.	Prepare working bibliography according to MLA, APA, CBE, or Chicago, depending on the warranted language style.
					Prepare a bibliography according to MLA, APA, CBE, or Chicago, depending on the warranted language style.
					Use parenthetical, footnotes and endnotes text citations accurately.
					Follow plagiarism and copyright rules and regulations.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC02.03	Communications	Language Arts Courses	Use correct grammar, punctuation and terminology to write and edit documents.	Compose multi-paragraph writing clearly, succinctly, and accurately to write documents.	Organize and arrange information for effective coherence.
					Report relevant information in order of occurrence.
					Interpret information, data, and observations correctly.
					Present main ideas and supporting facts.
				Use description of audience and purpose to prepare written documents.	Use technical terms and concepts.
					Incorporate and use references effectively and accurately.
					Report objective and/or subjective information.
				Use correct grammar, spelling, punctuation and capitalization to prepare written documents.	Use correct grammar and sentence structure.
					Use correct spelling.
					Use correct punctuation and capitalization.
				Use computer skills to design and develop written and supporting material.	Use word processing software to develop text, charts, graphs or figures correctly.
					Use presentation software to prepare visual support materials.
Format written documents with correct font and layout for easy reading.					

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC02.04	Communications	Language Arts Courses	Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.	Prepare oral presentation to provide information for intended purpose and audience.	Know subject matter well enough to be independent of written aids.
					Identify characteristics of the audience and adjust to their ability to understand.
					Use technical terms and concepts correctly.
				Identify and prepare support materials to accompany oral presentation.	Use proper organization and structure to achieve coherence of major points.
					Identify media and visual aids appropriate to understanding of topic.
					Prepare visual aids and support materials for easy viewing and without error.
				Deliver presentation to sustain listeners' attention and interest.	Smoothly and efficiently operate any equipment used with support.
					Deliver presentation without grammatical error.
					Speak clearly with appropriate volume, rate and gestures while making and maintaining appropriate eye contact.
					Use support materials in the presentation that enhance the understanding of the topic and the interest level of the audience.
					Stay within presentation time parameters.
					Evaluate listeners' interest and receptiveness.
Use verbal and nonverbal feedback strategies to engage discussion and adjust message and delivery.	Use verbal and nonverbal feedback strategies to engage discussion and adjust message and delivery.				
	Respond to questions and comments.				

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC02.05	Communications	Language Arts Courses	Interpret verbal and nonverbal behaviors to enhance communication with co-workers and clients/participants.	Interpret verbal behaviors to enhance communication.	Identify verbal cues.
					Observe voice speed, voice quality and tone.
					Explain message conveyed by verbal behaviors.
				Interpret nonverbal behaviors to enhance communication.	Identify nonverbal cues.
				Observe eye contact, facial expressions, posture, gestures and other body language.	
				Explain message conveyed by nonverbal behaviors.	
ITC02.06	Communications	Language Arts Courses	Apply active listening skills to obtain and clarify information.	Interpret message/information given to clarify information.	Determine familiarity of discussion.
					Respond accordingly using appropriate verbal and nonverbal language.
					Explain the message given in your own words.
				Respond with restatement and clarification techniques to clarify information.	Ask questions to seek or confirm understanding.
					Paraphrase and/or repeat information.
					Record and summarize information in written notes.
			Follow directions and/or respond in a positive way with clear, concise comments.		



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ITC02.07	Communications	Language Arts Courses	Interpret and use tables, charts, and figures to support written and oral communications.	Develop tables, charts and figures to support written and oral communication.	Compile facts and arrange in an organized manner for a table, chart or figure. Document sources of data. Determine most appropriate way to display data for effective coherence. Prepare table, chart, graph or figure for inclusion in publication or presentation.
				Interpret tables, charts and figures used to support written and oral communication.	Evaluate reference or source of data for authenticity and reliability. Explain information presented in tables, charts and figures. Prepare written summary of findings expressed in tables, charts and figures.
ITC02.08	Communications	Language Arts Courses	Demonstrate sensitivity in communicating with a diverse workforce.	Understand factors and strategies for communicating with a diverse workforce.	Identify factors (e.g., culture, ethnicity, equity, special/exceptional needs) that impact communication. Identify strategies for successful communication with a diverse workforce.
				Demonstrate ability to communicate and resolve conflicts with a diverse workforce.	Determine communication style appropriate for listener(s). Bridge communication styles. Establish guidelines for dealing with conflict.
ITC02.09	Communications	Language Arts Courses	Conduct meetings.	Plan and schedule meetings.	Plan meeting. Set agenda. Schedule meeting. Reserve meeting room. Invite appropriate personnel. Identify need for outside speakers. Assign someone to take minutes.



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			(CONTINUED)	Conduct meetings.	Make introductions. Invite questions, comments, and group participation. Determine appropriate action, time frame, and person accountable for identified tasks. Monitor time. Publish minutes in timely manner.
ITC02.10	Communications	Language Arts Courses #1: Introduction to Information Technology	Build customer relations.	Demonstrate knowledge of organization's offerings and of customers' importance to the organization. Demonstrate ability to assist customers in a professional manner. Effectively use organizational protocols and systems to fulfill customer service requirements.	Identify organizations' products and services (including own strengths as a sales agent). Recognize the importance of all customers to the business. Determine customers' individual needs. Project a professional business image (e.g., appearance, voice, grammar, word usage, enunciation, nonverbal communication). Interact with customers and colleagues in a professional (e.g., prompt, friendly, courteous, respectful, helpful, knowledgeable, and understandable) manner. Comply with established business protocols and company policies. Communicate company policies to customers. Handle merchandise returns in accordance with customer service policy. Handle customer complaints in accordance with customer service policy. Facilitate customer service through the maintenance of key information systems.



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ITC03.01	Problem Solving and Critical Thinking	#3: Fundamentals of Computer Systems	Guide progress in assigned areas of responsibility/accountability.	Set goals.	Set short- and long-term goals for assigned areas of responsibility/accountability.
				Monitor and adjust goals.	Demonstrate commitment to established goals and vision.
					Obtain support for goals.
					Provide support for goals.
				Communicate and recognize goal achievement.	Monitor goal achievement.
					Adjust goals.
Communicate goal achievement.	Provide recognition for goal achievement.				
ITC03.02	Problem Solving and Critical Thinking	#3: Fundamentals of Computer Systems	Conduct technical research.	Determine audience and information needs.	Identify target audience.
				Gather information.	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.
				Evaluate information.	Determine the accuracy and completeness of the information gathered.



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ITC03.03	Problem Solving and Critical Thinking	#3: Fundamentals of Computer Systems	Produce a quality product/service.	Understand product/service design.	Design product (e.g., using brainstorming, thumbnail sketches, rendering).
					Consider customer satisfaction in determining product characteristics (e.g., usefulness, price, operation, life, reliability, safety, cost of operation).
				Use reliability factors effectively to plan for and create products/services.	Consider reliability factors (e.g., cost, human, producibility).
					Achieve reliability through maintainability, good design, design simplification, and design redundancy.
					Recognize the relationship of maintainability and reliability.
					Align cost components with quality objectives.
					Classify quality costs (e.g., preventive, evaluation, pre-delivery failures, post-delivery failures).
				Test and maintain products/services.	Test products for reliability.
	Initiate predictive maintenance procedures.				



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC03.04	Problem Solving and Critical Thinking	#4: Introduction to Network Systems #4: Introduction to Information Support and Services #4: Fundamentals of Programming and Software Development #4: Fundamentals of Digital Communications	Demonstrate knowledge of the process required to evaluate and verify the nature of a problem.	Understand information systems theory and practice.	Demonstrate knowledge of the underlying concepts of the information systems discipline.
					Demonstrate knowledge of methods for achieving productivity in knowledge work.
					Apply general systems theory to the analysis and development of an information system.
					Identify procedures for formal problem-solving.
					Demonstrate knowledge of the fundamental concept of information theory and organizational system processes.
					Identify the essential properties of information systems.
ITC03.05	Problem Solving and Critical Thinking		Demonstrate knowledge of the process required to solve a problem.	Understand information systems problem-solving techniques and approaches.	Demonstrate knowledge of problem-solving steps and techniques.
					Summarize application planning, development, and risk management for information system.
					Identify potential problems in system implementation.
					Demonstrate knowledge of the information analysis process.
					Demonstrate knowledge of information technology solutions.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC03.06	Problem Solving and Critical Thinking	#3: Fundamentals of Computer Systems	Demonstrate an ability to evaluate and verify the appropriateness of a solution to a problem.	Evaluate information systems problem-solving techniques and approaches.	Demonstrate knowledge of decision-making skills and techniques.
					Demonstrate knowledge of critical thinking skills and techniques.
					Summarize application planning, development, and risk management for information system.
					Identify potential problems in system implementation.
					Determine whether prototyping system is feasible.
					Develop a plan using data-oriented techniques.
					Evaluate systems engineering considerations.
					Determine software design process, from specification to implementation.
					Appraise software process and product life-cycle models.
Assess software design methods and tools.					



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ITC03.07	Problem Solving and Critical Thinking	#3: Fundamentals of Computer Systems	Demonstrate knowledge of information organization principles.	Understand information organization principles.	Demonstrate knowledge of group support technology for common knowledge requirements.
					Demonstrate knowledge of the information analysis process.
					Demonstrate knowledge of information technology solutions.
					Demonstrate knowledge of methods for achieving productivity in knowledge work.
ITC03.08	Problem Solving and Critical Thinking	#3: Fundamentals of Computer Systems	Demonstrate knowledge of design principles.	Understand and employ design and color principles.	Demonstrate knowledge of the two-dimensional picture plan.
					Demonstrate knowledge of the principles and elements of design and their relationship to each other.
					Demonstrate knowledge of the nature of color and color harmonies.
					Assess the impact of various color harmonies on a two-dimensional picture plan.
					Assess how color affects the principles of line, value, shape and form.



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ITC04.01	Information Technology Applications	#2: Information Technology Applications	Use Personal information Management (PIM)/ productivity applications.	Manage personal schedule and contact information.	Identify PIM applications such as MS Outlook, Lotus Notes, and others.
				Create memos and notes.	Create tasks (to-do) list. Manage daily/weekly/monthly schedule using applications such as Notes, MS Outlook, etc.
ITC04.02	Information Technology Applications	#2: Information Technology Applications	Use electronic mail applications.		Use email to communicate within and across organizations.
				Use email to share files and documents.	Access email attachments. Attach documents to messages. Save email messages/attachments. Demonstrate knowledge of contamination protection strategies for email.



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ITC04.03	Information Technology Applications	#2: Information Technology Applications	Use Internet applications.	Search for information and resources.	Select search engine(s) to use.
					Select appropriate search procedures and approaches.
					Locate information using search engine(s) and Boolean logic.
					Navigate web sites using software functions.
				Access and evaluate Internet resources.	Access business and technical information using the Internet.
					Access commercial, government, and education resources.
					Evaluate Internet resources (e.g., accuracy of information).
ITC04.04	Information Technology Applications	#2: Information Technology Applications	Use writing/publishing applications.	Prepare simple documents and other business communications.	Retrieve existing documents.
					Create documents (e.g., letters, memos, reports) using existing forms and templates.
					Safeguard documents using name and save functions.
					Format text using basic formatting functions.
					Employ word processing utility tools (e.g., spell checker, grammar checker, thesaurus).
				Prepare reports and other business communications, integrating graphics and other non-text elements.	Use advanced formatting features (e.g., headers/footers/dropped caps, and indexing).
					Place graphics in document.
					Enhance publications using different fonts, styles, attributes, justification, etc.
					Enhance publications using paint/draw functions.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Prepare complex publications.	Create new word processing forms, style sheets, and templates. Prepare publications using desktop publishing software. Format new desktop publishing files. Output desktop publishing files.
ITC04.05	Information Technology Applications	#2: Information Technology Applications	Use presentation applications.	Prepare presentations for training, sales and information sharing. Deliver presentations, with supporting materials.	Create computer presentation and handouts in accordance with basic principles of graphics design and visual communication. Insert graphic elements (e.g., graph, clip art, table) in a slide. Edit presentations. Identify hardware items that support presentation software (e.g., scanners, digital cameras, printers, and projection systems). Print a single slide, an entire presentation, an outline, and notes. Run slide shows manually and automatically.
ITC04.06	Information Technology Applications	#2: Information Technology Applications	Use spreadsheet applications.	Create a spreadsheet. Perform calculations and analysis on data.	Create spreadsheets. Retrieve existing spreadsheets. Edit spreadsheets. Save spreadsheets. Print spreadsheets. Group worksheets. Create charts and graphs from spreadsheets. Perform calculations using simple formulas. Input/process data using spreadsheet functions.



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ITC04.07	Information Technology Applications	#2: Information Technology Applications	Use database applications.	Manipulate data elements.	Enter data using a form.
					Locate/replace data using search and replace functions.
					Process data using database functions (e.g., structure, format, attributes, relationships, keys).
				Manage, analyze and report on interrelated data elements.	Search a database table to locate records.
					Sort data using single- and multiple-field sorts.
					Perform single- and multiple-table queries (e.g., create, run, save).
					Print forms, reports, and results of queries.
Verify accuracy of output.					
ITC04.08	Information Technology Applications	#2: Information Technology Applications	Use collaborative/groupware applications.	Facilitate group work through management of shared schedule and contact information.	Manage daily/weekly/monthly schedule using applications.
					Maintain shared database of contact information.
				Facilitate group work through management of shared files and online information.	Organize, store, and share files in network directories.
					Organize, store, and share files using web sites.
					Organize, store, and share files using document libraries or databases.
				Facilitate group work through instant messaging or virtual meetings.	Participate in virtual group discussions and meetings.



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ITC04.09	Information Technology Applications	#2: Information Technology Applications	Use computer operations applications.	Manage computer operations.	Apply basic commands of operating system software. Employ desktop operating skills.				
				Manage file storage.	Apply appropriate file and disk management techniques. Differentiate between files and directories. Determine file organization. Demonstrate knowledge of the system utilities used for file management.				
				Compress or alter files.	Convert file formats. Unpack files using compression software. Convert existing files.				
				ITC04.10	Information Technology Applications	#3: Fundamentals of Computer Systems	Use computer-based equipment (containing embedded computers (or processors) used to control electromechanical devices).	Operate computer-driven equipment and machines.	Secure needed supplies and resources. Follow power-up and log-on procedures. Interact with/respond to system messages using console device. Run applications/jobs in accordance with processing procedures. Follow log-off and power-down procedure(s).
								Use installation and operation manuals.	Access needed information using appropriate reference materials.
								Troubleshoot computer-driven equipment and machines and access support as needed.	Test system using diagnostic tools/software. Repair/replace malfunctioning hardware. Reinstall software as needed. Recover data and/or files. Restore system to normal operating standards.



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ITC05.01	Systems	#3: Fundamentals of Computer Systems	Characterize the nature of business.	Understand types and functions of businesses.	Identify types of business organizations and functions.
					Identify business reporting and information flow.
					Define stakeholder relationships (e.g., customers, employees, shareholders, and suppliers).
				Understand functions and interactions of departments within a business.	Demonstrate knowledge of the components of a business plan.
					Identify the ways in which organizational functions are interdependent.
					Identify types of communication channels (e.g., formal, informal).
					Define the role of strategic planning in business.
ITC05.02	Systems	#1: Introduction to Information Technology	Demonstrate knowledge of the nature of IT in business.	Understand the functions of information systems in business.	Determine how business activities interface with data processing functions.
					Differentiate between the role of information systems within a company and their role in a global environment.
					Measure increases in productivity realized by the implementation of information systems.
ITC05.03	Systems	#1: Introduction to Information Technology	Demonstrate knowledge of the operation of cross-functional teams in achieving project goals.	Understand the importance of cross-functional teams in achieving IT project goals.	Consider the benefits of using a cross-functional team in policy and procedure development.
					Identify desired group and team behavior in an IS context.



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ITC05.04	Systems	#1: Introduction to Information Technology	Explain/discuss general strategies for maximizing organizational learning and productivity in a high tech environment.	Understand strategies for maximizing productivity in a high tech environment.	Assess the importance of new technologies to future developments and to the future knowledge worker productivity.
					Demonstrate knowledge of methods for achieving productivity in knowledge work.
					Create/maintain an environment supportive of productivity.
ITC06.01	Safety, Health, and Environmental	#1: Introduction to Information Technology	Maintain a safe working environment.	Understand health and safety standards and concepts in the workplace.	Demonstrate knowledge of the relationship between health, safety, and productivity.
					Identify health and safety standards established by government agencies.
					Access needed safety information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, and flowcharts).
					Ensure maintenance of a clean work area.
					Solve safety problems using problem-solving, decision-making, and critical thinking strategies.
					Demonstrate knowledge of ergonomics and repetitive strain injury.



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ITC07.01	Leadership and Teamwork	#1: Introduction to Information Technology	Demonstrate knowledge of the skills needed for leadership in the IT environment.	Understand key approaches to successful leadership in the IT environment.	Demonstrate knowledge of how to apply team methods to empower coworkers.
					Establish goals and objectives for IS.
					Define mission and critical success factors.
					Identify desired group and team behavior in an IS context.
ITC07.02	Leadership and Teamwork	#1: Introduction to Information Technology	Build interpersonal skills with individuals and other team members.	Understand best practices for successful team functioning.	Analyze the interdependence of empathetic listening, synergy, and consensus building.
					Define roles within the group decision-making process.
					Demonstrate knowledge of how to apply team methods to empower coworkers.
				Apply best practices for successful team functioning.	Apply knowledge of group dynamics.
					Promote teamwork, leadership, and empowerment.
					Identify strategies for fostering creativity.



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ITC08.01	Ethics and Legal Responsibilities	#1: Introduction to Information Technology	Demonstrate appropriate knowledge and behaviors of legal responsibilities and of positive cyber-citizenry.	Understand legal issues faced by IT professionals.	Demonstrate knowledge of the legal issues that face information technology professionals.
					Identify issues and trends affecting computers and information privacy.
ITC08.02	Ethics and Legal Responsibilities	#1: Introduction to Information Technology	Demonstrate knowledge of the rights and responsibilities of IT workers.	Understand the rights and responsibilities of IT workers.	Identify generally accepted business ethics.
					Demonstrate knowledge of federal laws governing discrimination and harassment.
					Demonstrate knowledge of key concepts related to employment discrimination.
					Demonstrate sensitivity to diversity, including differences in gender, culture, race, language, physical and mental challenges, and family structures.
					Establish procedures for maintaining the confidentiality of client information.
ITC08.03	Ethics and Legal Responsibilities	#1: Introduction to Information Technology	Demonstrate knowledge of social, ethical, and legal issues in the information technology field.	Understand ethical issues in the IT field.	Analyze the social implications of decisions made and actions taken as an information technology professional.
					Demonstrate knowledge of the ethical issues that face information technology professionals.
				Understand legal issues in the IT field.	Determine the practical implications of lawsuits in terms of good will, client relations, the bottom line, diversion of company resources, cash flow and accounts receivable.
					Demonstrate knowledge of basic business law concepts.



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ITC09.01	Employability and Career Development	#1: Introduction to Information Technology	Explain written organizational policies, rules and procedures to help employees perform their jobs.	Locate appropriate information on organizational policies in handbooks and manuals.	Identify the contents of various organizational publications.
					Determine the appropriate document(s) for specific job responsibilities and work assignments.
				Discuss how specific organizational policies and rules influence a specific work situation.	Locate and identify specific organizational policy, rule or procedure to assist with a given situation.
					Articulate how a specific organizational policy, rule or procedure will improve a given situation.
ITC09.02	Employability and Career Development	#1: Introduction to Information Technology	Identify and demonstrate positive work behaviors and personal qualities.	Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.	Demonstrate regular attendance.
					Follow company dress and appearance standards.
					Exhibit pride in work.
					Demonstrate leadership and teamwork.
				Demonstrate flexibility and willingness to learn new knowledge and skills.	Exhibit ability to handle stress.
					Display initiative and open-mindedness.
					Participate in company orientation and training programs with enthusiasm.
				Exhibit commitment to the organization.	Identify progressive strategies that will impact efficiency of job.
					Follow established rules, regulations and policies.
					Explain employer/management responsibilities.
Demonstrate cost effectiveness.					
Demonstrate time management.					
Complete all tasks thoroughly.					



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ITC09.03	Employability and Career Development	#1: Introduction to Information Technology	Identify and explore career opportunities in one or more career pathways.	Locate and identify career opportunities that appeal to personal career goals.	Locate and interpret career information for at least one career cluster.
					Identify job requirements for three career pathways.
					Identify educational and credentialing requirements for three careers.
				Match personal interests and aptitudes to selected careers.	Identify personal interests and aptitudes.
					Identify job requirements and characteristics of selected careers.
					Compare personal interests and aptitudes with job requirements and characteristics.
					Modify career goals based on results of personal interests and aptitudes with career requirements and characteristics.
ITC09.04	Employability and Career Development	#1: Introduction to Information Technology	Develop a personal career plan to meet career goals and objectives.	Develop career goal and objectives to plan future career direction.	Identify career that matches individual interests and aptitudes.
					Develop career goal with time frame.
					Identify goals and objectives for reaching and advancing in career.
				Develop strategies to reach career objectives.	Write a list of strategies for achieving educational requirements.
					Identify strategies for obtaining employment experiences.
					Write a time line for achieving career goals and objectives.
					List alternatives and potential changes.



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ITC09.05	Employability and Career Development	#1: Introduction to Information Technology	Demonstrate ability to seek and apply for employment.	Use multiple resources to locate job opportunities.	Identify resources for finding employment.
					Analyze resources to determine those that are most appropriate for desired career.
					Compare job requirements with personal qualifications, interests, and aptitudes.
					Select job that matches personal qualifications, interests, and aptitudes.
				Prepare a resume and letter of application to apply for employment.	Identify prospective employer's submission requirements.
					Gather information and prepare rough draft of resume.
					Put resume in proper format.
					Write letter of application for specific job opening in correct format, without error.
				Complete an employment application to obtain employment.	Gather information for application.
					Complete all questions on application with appropriate and honest answers.
					Sign and date application.
					Attach any supporting material required or requested.
				Interview to obtain employment.	Submit full application package to employers.
					Dress appropriately for interview.
					Exhibit professional conduct before, during and after interview.
Explain your qualifications and interests clearly and concisely.					
Answer all questions honestly and concisely.					
Write follow-up letter after the interview.					



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ITC09.06	Employability and Career Development	#1: Introduction to Information Technology	Demonstrate ability to evaluate and compare employment opportunities and accept employment.	Evaluate and compare employment opportunity to individual needs and career plan.	Identify job advantages and disadvantages.
				Accept or reject employment.	Compare job benefits to individual needs.
					Compare job opportunities and responsibilities to career plan.
					Make decision to accept or reject employment.
					Write acceptance or rejection letter without error.
					Complete employment forms upon acceptance.
ITC09.07	Employability and Career Development	#1: Introduction to Information Technology	Provide examples of how IT is transforming business in various industries.	Understand the impact of IT on business.	Demonstrate knowledge of how both PCs and larger computer systems impact people and are used in business/industry/government and other institutions.
					Demonstrate knowledge of the impact of computers on career pathways in business/industry (e.g., how computers have eliminated and created jobs).
					Demonstrate knowledge of the impact of computers on access to information and information exchange worldwide.
					Demonstrate knowledge of ethical issues that have surfaced in the information age.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC09.08	Employability and Career Development	#1: Introduction to Information Technology	Demonstrate knowledge of the relationship between lifelong learning and IT career development.	Demonstrate knowledge of IT as a constantly changing and fast growing field.	Identify present and future IT employment opportunities.
					Demonstrate knowledge of the potential impact of IT on future society.
					Identify the importance of lifelong learning in the IT field.
				Identify education and training requirements for selected career pathway.	Identify certification and/or degree requirements.
				Identify required knowledge and skills for career ladder.	
				Identify education and training opportunities available for selected career pathway.	Research educational and training opportunities.
Identify present and future IT education and training opportunities.					
					Design a lifelong learning plan that ties in with career advancement plan.
ITC09.09	Employability and Career Development	#1: Introduction to Information Technology	Demonstrate knowledge of career development/progression patterns in the IT industry.	Identify career development patterns in the IT industry.	Identify education and training requirements for IT career pathways.
				Identify and understand the benefits of membership in professional IT organizations.	Identify professional organizations in the area of information technology.
					Identify benefits derived from membership in specific professional organizations.

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC10.01	Technical Skills	#3: Fundamentals of Computer Systems	Demonstrate knowledge of the hardware components associated with information systems.	Understand the fundamentals of operating systems.	Identify major operating system fundamentals and components.
				Explain the role of number systems in information systems.	Identify the role the binary system in information systems.
					Demonstrate knowledge of number systems and internal data representation.
				Identify computer classifications and hardware.	Identify the three main classifications of computers (i.e., micro-, mid-range, and mainframes).
					Identify major hardware components and their functions.
					Identify the hardware associated with telecommunications functions.
					Identify types of computer storage devices.
	Understand elements and types of information processing.	Identify the elements of the information processing cycle (i.e., input, process, output, and storage).			
		Identify types of processing (e.g., batch, interactive, event-driven, object-oriented).			
		Use available reference tools as appropriate.	Access needed information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts).		
ITC10.02	Technical Skills	#3: Fundamentals of Computer Systems	Demonstrate knowledge of the classes of software associated with information systems.	Explain the key functions and applications of software.	Demonstrate knowledge of the key functions of systems software.
					Demonstrate knowledge of widely used software applications (e.g., word processing, database management, spreadsheet development).
					Demonstrate knowledge of the function and operation of compilers and interpreters.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Understand the range of languages used in software development.	Demonstrate knowledge of the range of languages used in software development.
				Understand how data is organized in software development.	Demonstrate knowledge of how data is organized in software development.
				Explain new and emerging classes of software.	Identify new and emerging classes of software.
ITC10.03	Technical Skills	#3: Fundamentals of Computer Systems	Explore the future of information technologies.	Explain measurement techniques for increased productivity due to information systems implementation.	Measure increases in productivity realized by the implementation of information systems.
				Identify new IT technologies and assess their potential importance and impact in the future.	Identify new technologies relevant to information technology.
					Assess the importance of new technologies to future developments and to future knowledge worker productivity.
					Identify new and emerging drivers and inhibitors of information technology change.
ITC10.04	Technical Skills	#3: Fundamentals of Computer Systems	Demonstrate knowledge of basic data communications components and trends.	Explain data communications procedures, equipment and media.	Demonstrate knowledge of key communications procedures.
					Demonstrate knowledge of the uses of data communication equipment.
					Demonstrate knowledge of types of communications media.
				Understand data transmission codes and protocols.	Demonstrate knowledge of data transmission codes and protocols.
				Explain the differences between local and wide area networks.	Distinguish between local area networks and wide area networks.
				Understand data communications trends and issues.	Identify data communication trends.
					Identify major current issues in data communications.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC10.05	Technical Skills	#2: Information Technology Applications	Demonstrate technical knowledge of the Internet.	Understand Internet protocols.	Demonstrate knowledge of the Transmission Control Protocol/Internet Protocol (TCP/IP) suite.
					Demonstrate knowledge of Simple Network Management Protocol (SNMP).
					Demonstrate knowledge of IP forwarding, encapsulation, and fragmentation.
				Explain Domain Name Server (DNS).	Demonstrate knowledge of the Domain Name Server (DNS).
				Understand Internet security issues and systems available for addressing them.	Demonstrate knowledge of Internet security issues.
					Identify available Internet security systems.
ITC10.06	Technical Skills	#2: Information Technology Applications	Access the Internet.	Use and troubleshoot Internet connection.	Connect to the Internet.
					Test Internet connection.
				Explain the components of Internet software.	Demonstrate knowledge of the components of Internet software.
				Install and use Internet software.	Explore browser features.
					Install Internet software.
					Download free software upgrades and shareware from the Internet.
	Unpack files using compression software.				
Understand virus protection procedures.	Demonstrate acute awareness of virus protection techniques.				
ITC10.07	Technical Skills	#2: Information Technology Applications	Utilize Internet services.	Use web browser software.	Navigate web sites using software functions (e.g., Forward, Back, Go To, Bookmarks).
					Bookmark web addresses (URLs).



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Apply search procedures to locate information on the Internet.	Select search engine(s) to use.
					Select appropriate search procedures and approaches.
					Locate information using search engine(s) and Boolean logic.
				Obtain, compile and evaluate information from the Internet.	Access business and technical information using the Internet.
					Access library catalogs on the Internet.
					Access commercial, government, and education resources.
					Compile a collection of business sites (e.g., finance and investment).
					Evaluate Internet resources (e.g., accuracy of information).
				Install and download software from the Internet.	Download files from FTP archives.
					Retrieve online tools.
					Download/convert Internet programming files.
					Install/configure web browser.
					Explore the multimedia capabilities of the World Wide Web.
					Add plug-ins and helpers to the web browser.
					Archive files.
			Use the Internet to communicate and collaborate.	Communicate via email using the Internet.	
				Subscribe to mailing lists.	
				Participate in newsgroups.	
				Explore collaboration tools.	
				Participate in online audio and video conferencing.	
				Explore electronic commerce.	

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC10.08	Technical Skills	#3: Fundamentals of Computer Systems	Install and configure software programs.	Ensure that hardware and software system components are compatible prior to performing installation.	Identify hardware requirements (e.g., processor, memory, disk space, communications, printers, monitors).
					Determine compatibility of hardware and software.
				Ensure that software to be installed is licensed prior to performing installation.	Verify conformance to licensing agreement.
				Perform installation accurately and completely, using available resources as needed.	Install given application/system software on various platforms in accordance with manufacturer's procedures.
					Disable/uninstall software that may interfere with installation of new software.
					Differentiate between procedures for an upgrade and for a new installation.
					Differentiate between stand-alone and network installation procedures.
					Select appropriate installation options (e.g., default, customized).
					Configure software to appropriate operating system settings.
					Configure macros, tools, and packages to accomplish simple organizational and personal tasks.
					Convert data files if required.
					Verify software installation and operation.
				Resolve problems with installation if they occur.	Troubleshoot unexpected results.
					Access needed help using manufacturers' technical help lines or Internet sites.
	Formulate new installation procedure if needed.				
Perform customization as requested.	Customize software to meet user preferences.				
Clearly document procedures for future use.	Document step-by-step installation and configuration procedures.				

Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC10.09	Technical Skills	#3: Fundamentals of Computer Systems	Demonstrate knowledge of web page basics.	Explain the features and functions of web browsing software.	Demonstrate knowledge of the role of browsers in reading files on the World Wide Web (text-only, hypertext).
					Identify how different browsers affect the look of a web page.
					Demonstrate knowledge of the characteristics and uses of plug-ins.
				Explain the features and functions of web page design software.	Compare/contrast the features and functions of software editors available for designing web pages.
				Understand the differences between a client and a server.	Differentiate between a client and a server.
				Understand how bandwidth affects data transmission and on-screen image.	Demonstrate knowledge of how bandwidths affect data transmission and on-screen image.
				Explain the benefits of hosting a web site on a local server vs. at an ISP (Internet Service Provider).	Compare the advantages and disadvantages of running your own server vs. using a server provider.
ITC10.10	Technical Skills	#3: Fundamentals of Computer Systems	Operate system.	Configure/modify system as needed.	Secure needed supplies and resources.
					Review automated scheduling software.
					Identify data requirements.
					Identify scheduling priority in programming.
					Build system software command structures using operating system macro facilities for computer systems.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Apply knowledge of operating systems principles to ensure optimal functioning of system.	Apply basic commands of operating system software.
					Apply appropriate file and disk management techniques.
					Employ desktop operating skills.
					Handle materials and equipment in a responsible manner.
					Follow power-up and log-on procedures.
					Interact with/respond to system messages using console device.
					Run applications/jobs in accordance with processing procedures.
					Follow log-off and power-down procedure(s).
				Use available reference tools as appropriate.	Access needed information using appropriate reference materials.
				Document procedures and actions.	Develop audit trails.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC10.11	Technical Skills	#2: Information Technology Applications	Perform standard computer backup procedures.	Explain the need for regular backup procedures.	Recognize the need for regular backup procedures.
				Configure and maintain backup system.	Load backup software.
					Load compression drive backup software.
					Install surge suppression protection.
					Identify battery backup equipment.
				Perform backup procedures.	Perform restore operation using backup software.
Perform restore operation using compression drive backup software.					
ITC10.12	Technical Skills	#2: Information Technology Applications	Describe system components.	Understand CPUs.	Demonstrate knowledge of central processing unit (CPU) control and architecture.
					Identify CPU modes of operations.
				Understand operating systems.	Demonstrate knowledge of operating system architecture types.
					Identify operating system goals.
					Demonstrate knowledge of operating system structuring methods, layered models, and the object-server model.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)		Differentiate between microcomputer, minicomputer, and mainframe operating systems.
					Demonstrate knowledge of network operating systems.
					Define the role of memory management in an operating system.
					Demonstrate knowledge of the commands used to handle tasks in operating systems.
					Demonstrate knowledge of interface theory in an operating system.
				Understand the fundamentals of operating systems.	Demonstrate knowledge of the basics of process management.
					Demonstrate knowledge of the system utilities used for file management.
ITC10.13	Technical Skills	#2: Information Technology Applications	Maintain security requirements.	Understand potential security threats to information systems.	Demonstrate knowledge of potential internal and external threats to security.
				Assess security threats and develop plan to address them.	Maximize threat reduction.
					Assess exposure to security issues.
					Implement countermeasures.
					Ensure compliance with security rules, regulations, and codes.
					Demonstrate knowledge of virus protection strategy.
					Implement security procedures in accordance with business ethics.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Implement and document security procedures.	Maintain confidentiality. Load virus detection and protection software. Identify sources of virus infections. Remove viruses. Report viruses in compliance with company standards. Implement backup and recovery procedures. Follow disaster plan. Provide for user authentication (e.g., assign passwords, access level). Document security procedures.
ITC10.14	Technical Skills	#3: Fundamentals of Computer Systems	Employ computer system interfaces.	Configure systems to provide optimal system interfaces.	Define hardware-software interface issues for a computer system. Identify standards and issues related to I/O programming and design of I/O interfaces. Interface peripheral devices/controllers in the computer system (e.g., software and hardware interrupts, exceptions, Direct Memory Addressing [DMA], bus structures). Apply concepts of privileged instructions and protected mode programming. Configure peripheral device drivers (e.g., disk, display, printer, modem, keyboard, mouse, network). Apply advanced I/O concepts (e.g., disk caching, data compression, extended memory, magnetic disk/CD-ROM storage and formats). Allocate disk space, non-sharable resources, and I/O devices.



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC10.15	Technical Skills	#8: Network Systems Maintenance and Support	Maintain system.	Implement queries and reports to provide access to critical system information.	Create a query to extract information from a file.
					Create a query to extract information from multiple files.
					Create reports from queries.
					Create and use logical files.
					Develop a display screen for use with high-level language program.
					Access needed information using appropriate reference materials
				Ensure that system is functioning optimally.	Monitor system status and performance.
					Run diagnostics.
					Respond to system messages.
					Perform preventive maintenance procedures on computer and peripheral devices.
					Handle materials and equipment in a responsible manner.
					Optimize windows environment to maximize performance of desktop resources.
				Repair and document system problems.	Review automated scheduling software.
					Repair recoverable problems.
					Restore system.
	Document computer system malfunction(s).				
	Document software malfunction(s).				



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
ITC10.16	Technical Skills	#4: Introduction to Network Systems	Provide support and training.	Provide help desk service to computer users within the organization.	Operate help desk.
					Employ desktop productivity tools.
					Support computer users.
				Provide training.	Train computer users.
			Ensure that network is functioning within specifications.	Support Network Operating Center (NOC).	Demonstrate knowledge of the operations of Network Operating Center (NOC).
ITC10.17	Technical Skills	#2: Information Technology Applications	Demonstrate a basic knowledge of quality assurance concepts.	Explain the history and standards of key quality management initiatives.	Demonstrate knowledge of the historical evolution of quality assurance/total quality management (e.g., Deming, ISO 9000).
					Demonstrate knowledge of changes brought about by quality leaders in the world.
					Demonstrate knowledge of the ISO 9000 process.
					Demonstrate knowledge of the standards/requirements for the Baldrige award.
					Demonstrate knowledge of successful efforts by industry to improve quality and/or reduce costs.
				Explain the terminology, role and benefits of quality within an organization.	Demonstrate knowledge of quality management terminology.
					Identify the role of quality within the organization.
	Identify the features and benefits of quality planning.				



Code	Topic	Course	Knowledge and Skill	Performance Element	Measurement Criteria
			(CONTINUED)	Explain the elements of a quality management system.	<p>Demonstrate knowledge of the control devices used in functional areas (e.g., SPC, equipment).</p> <p>Demonstrate knowledge of the relationship among organizational structures, policies, procedures, and quality assurance.</p> <p>Identify internal and external customers.</p> <p>Differentiate between prevention and detection.</p> <p>Differentiate between variable and attribute data.</p> <p>Identify types of control charts.</p> <p>Demonstrate knowledge of how statistical techniques are used to control quality (e.g., SPC, DOE, CR).</p>