Cluster Knowledge and Skill Statement

Academic Foundations

Statement: Demonstrate Language Arts knowledge and skills required to pursue the full-range of career and post-secondary education opportunities within the IT career cluster.

Performance Element: Listen actively.

Performance Element: Adapt language (diction/structure, style) for audience, purpose, situation.

Performance Element: Collect/Organize oral and written information.

Performance Element: Compose/edit (agenda, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, technical terminology).

Performance Element: Comprehend oral and written information (cause/effect, comparisons/contrasts, conclusions, context, purpose, charts/tables/graphs, evaluation/critiques, mood, persuasive text, sequence, summaries, technical matter).

Performance Element: Evaluate oral and written information (accuracy, adequacy/sufficiency, appropriateness, clarity, conclusions/solutions, fact/opinion, propaganda, relevancy, validity, relationship of ideas).

Performance Element: Identify (oral and written) assumptions, purpose, outcomes/solutions, and propaganda techniques.

Performance Element: Predict from oral and written information trends, outcomes/solutions.

Performance Element: Present formal and informal speech, discussion, information requests/supplying, interpretation, persuasive.

Performance Element: Use library, text and Internet resources.

Statement: Demonstrate Mathematics knowledge and skills required to pursue the full-range of career and post-secondary education opportunities within the IT career cluster.

Performance Element: Identify whole numbers, decimals, fractions, complex numbers, polynomials, geometrical figures.

Performance Element: Apply basic arithmetic add, subtract, multiply, and divide operations.

Performance Element: Applied relational (equal, not equal, greater than, less then, etc.) and logical operators in a logical expression.

Performance Element: Understand the relationship of data and measurements to the problem.

Performance Element: Produce mathematical formulae, expressions, and/or sequence of solution steps from problem statements.

Performance Element: Analyze problem statements for missing/irrelevant data, estimate/exact values, inconsistent parameters.

Performance Element: Construct charts/tables/graphs from functions and data.
Cluster Knowledge and Skill Statement

Performance Element: Describe problem solving techniques (for example: successive approximation, trial and error).

Statement: Demonstrate Science knowledge and skills required to pursue the full-range of career and post-secondary education opportunities within the IT career cluster.

Performance Element: Analyze/evaluate conclusions, conflicting data, controls, data, inferences, limitations, questions, sources of errors, variables.

Performance Element: Use computers for information processing, mathematical applications and problem solving.

Performance Element: Apply/use scientific methods in qualitative and quantitative analysis, data gathering, direct and indirect observation, predictions, problem identification.
Cluster Knowledge and Skill Statement

Communications

Statement: Comprehend and use reading strategies to learn meaning, technical concepts, vocabulary, and follow instructions.

Performance Element: Determine and use reading strategy (skimming, reading for detail, reading for meaning and critical analysis) to determine purpose of text.

Measurement Criteria: Use reading strategy to achieve intended purpose.

Measurement Criteria: Identify purpose of text.

Measurement Criteria: Identify complexity of text.

Measurement Criteria: Explain purpose of text.

Performance Element: Analyze information, read to learn meaning, technical concepts, vocabulary, and follow directions.

Measurement Criteria: Determine relevance, accuracy and appropriateness to purpose.

Measurement Criteria: Identify complexities and discrepancies in information.

Measurement Criteria: Analyze information presented in a variety of formats, such as tables, lists, figures.

Measurement Criteria: Identify key technical concepts and vocabulary.

Measurement Criteria: Follow all instructions as specifically given.

Performance Element: Interpret, transcribe and communicate information, data, and observations to apply information learned from reading to actual practice.

Measurement Criteria: Explain meaning of new terms, vocabulary and concepts.

Measurement Criteria: Interpret technical materials used.

Measurement Criteria: Summarize overall meaning of text.

Measurement Criteria: Write specific steps for applying information learned to task or new situation.

Measurement Criteria: Write set of directions for others sharing information learned and applying that to task or new situation.

Statement: Locate, organize and reference written information from various sources to communicate with co-workers and clients/participants.

Performance Element: Locate written information to communicate with co-workers and clients/participants.

Measurement Criteria: Identify topic.

Measurement Criteria: Conduct search of information using card catalog, keywords, and/or search engines.

Measurement Criteria: Locate variety of resources such as books, journals, and magazines.

Measurement Criteria: Locate information from electronic forms including the Internet.

Measurement Criteria: Organize resources to use key information.

Performance Element: Organize information to use in written and oral communications.

Measurement Criteria: Read and take notes from selected resources.

Measurement Criteria: Prepare outline that emphasizes major points with supporting data.

Measurement Criteria: Present information in organized, easy-to-follow manner.

Measurement Criteria: Prepare working bibliography according to MLA, APA, CBE, Chicago, depending on the warranted language style.
Cluster Knowledge and Skill Statement

Performance Element: Document the source and proper reference for written information.

Measurement Criteria: Prepare a bibliography according to MLA, APA, CBE, Chicago, depending on the warranted language style.

Measurement Criteria: Use parenthetical, footnotes and endnotes text citations accurately.

Measurement Criteria: Follow plagiarism and copyright rules and regulations.

Statement: Use correct grammar, punctuation and terminology to write and edit documents.

Performance Element: Compose multi-paragraph writing clearly, succinctly, and accurately to write documents.

Measurement Criteria: Organize and arrange information for effective coherence.

Measurement Criteria: Report relevant information in order of occurrence.

Measurement Criteria: Interpret information, data, and observations correctly.

Measurement Criteria: Present main ideas and supporting facts.

Performance Element: Use description of audience and purpose to prepare written documents.

Measurement Criteria: Use technical terms and concepts.

Measurement Criteria: Incorporate and use references effectively and accurately.

Measurement Criteria: Report objective and/or subjective information.

Performance Element: Use correct grammar, spelling, punctuation and capitalization to prepare written documents.

Measurement Criteria: Use correct grammar and sentence structure.

Measurement Criteria: Use correct spelling.

Measurement Criteria: Use correct punctuation and capitalization.

Performance Element: Use computer skills to design and develop written and supporting material.

Measurement Criteria: Use word processing software to develop text, charts, graphs or figures correctly.

Measurement Criteria: Use presentation software to prepare visual support materials.

Measurement Criteria: Format written documents with correct font and layout for easy reading.

Statement: Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.

Performance Element: Prepare oral presentation to provide information for intended purpose and audience.

Measurement Criteria: Know subject matter well enough to be independent of written aids.

Measurement Criteria: Identify characteristics of the audience and adjust to their ability to understand.

Measurement Criteria: Use technical terms and concepts correctly.

Measurement Criteria: Use proper organization and structure to achieve coherence of major points.
Information Technology

Cluster Knowledge and Skill Statement

Performance Element: Identify and prepare support materials to accompany oral presentation.

Measurement Criteria: Identify media and visual aids appropriate to understanding of topic.

Measurement Criteria: Prepare visual aids and support materials for easy viewing and without error.

Measurement Criteria: Operate any equipment used with support materials smoothly and efficiently.

Performance Element: Deliver presentation to sustain listener’s attention and interest.

Measurement Criteria: Deliver presentation without grammatical error.

Measurement Criteria: Speak clearly with appropriate volume, rate and gestures while making and maintaining appropriate eye contact.

Measurement Criteria: Use support materials in the presentation that enhance the understanding of the topic and the interest level of the audience.

Measurement Criteria: Stay within presentation time parameters.

Measurement Criteria: Evaluate listeners’ interest and receptiveness.

Measurement Criteria: Use verbal and nonverbal feedback strategies to engage discussion and adjust message and delivery.

Measurement Criteria: Respond to questions and comments on presentation.

Statement: Interpret verbal and nonverbal behaviors to enhance communication with co-workers and clients/participants.

Performance Element: Interpret verbal behaviors to enhance communication.

Measurement Criteria: Identify verbal cues.


Measurement Criteria: Explain message conveyed by verbal behaviors.

Performance Element: Interpret nonverbal behaviors to enhance communication.

Measurement Criteria: Identify nonverbal cues.

Measurement Criteria: Observe eye contact, facial expressions, posture, gestures and other body language.

Measurement Criteria: Explain message conveyed by nonverbal behaviors.

Statement: Apply active listening skills to obtain and clarify information.

Performance Element: Interpret message/information given to clarify information.

Measurement Criteria: Determine familiarity of discussion.

Measurement Criteria: Respond accordingly using appropriate verbal and non verbal language.

Measurement Criteria: Explain the message given in your own words.

Performance Element: Respond with restatement and clarification techniques to clarify information.

Measurement Criteria: Ask questions to seek or confirm understanding.

Measurement Criteria: Paraphrase and/or repeat information.

Measurement Criteria: Record and summarize information in written notes.

Statement: Interpret and use tables, charts, and figures to support written and oral communications.
Cluster Knowledge and Skill Statement

Performance Element: Develop tables, charts and figures to support written and oral communication.

**Measurement Criteria:** Compile facts and arrange in an organized manner for a table, chart or figure.

**Measurement Criteria:** Document sources of data.

**Measurement Criteria:** Determine most appropriate way to display data for effective coherence.

**Measurement Criteria:** Prepare table, chart, graph or figure for inclusion in publication or presentation.

Performance Element: Interpret tables, charts and figures used to support written and oral communication.

**Measurement Criteria:** Evaluate reference or source of data for authenticity and reliability.

**Measurement Criteria:** Explain information presented in tables, charts and figures.

**Measurement Criteria:** Prepare written summary of findings expressed in tables, charts and figures.

Statement: Demonstrate sensitivity in communicating with a diverse workforce.

Performance Element: Understand factors and strategies for communicating with a diverse workforce.

**Measurement Criteria:** Identify factors (e.g., culture, ethnicity, equity, special/exceptional needs) that impact communication.

**Measurement Criteria:** Identify strategies for successful communication with a diverse workforce.

Performance Element: Demonstrate ability to communicate and resolve conflicts with a diverse workforce

**Measurement Criteria:** Determine communication style appropriate for listener(s).

**Measurement Criteria:** Bridge communication styles.

**Measurement Criteria:** Establish guidelines for dealing with conflict.

Statement: Conduct meetings.

Performance Element: Plan and schedule meetings.

**Measurement Criteria:** Plan meeting.

**Measurement Criteria:** Set agenda.

**Measurement Criteria:** Schedule meeting.

**Measurement Criteria:** Reserve meeting room.

**Measurement Criteria:** Invite appropriate personnel.

**Measurement Criteria:** Identify need for outside speakers.

**Measurement Criteria:** Assign someone to take minutes.

Performance Element: Run meetings.

**Measurement Criteria:** Make introductions.

**Measurement Criteria:** Invite questions, comments, and group participation.

**Measurement Criteria:** Determine appropriate action, time frame, and person accountable for identified tasks.

**Measurement Criteria:** Monitor time.

**Measurement Criteria:** Publish minutes in timely manner.

Statement: Build customer relations.
Cluster Knowledge and Skill Statement

Performance Element: Demonstrate knowledge of organization’s offerings and of customers’ importance to the organization.

**Measurement Criteria:** Identify organizations' products and services (including own strengths as a sales agent).

**Measurement Criteria:** Recognize the importance of all customers to the business.

Performance Element: Demonstrate ability to assist customers in a professional manner.

**Measurement Criteria:** Determine customers' individual needs.

**Measurement Criteria:** Project a professional business image (e.g., appearance, voice, grammar, word usage, enunciation, nonverbal communication).

**Measurement Criteria:** Interact with customers and colleagues in a professional manner (e.g., prompt, friendly, courteous, respectful, helpful, knowledgeable, understandable).

Performance Element: Effectively use organizational protocols and systems to fulfill customer service requirements.

**Measurement Criteria:** Comply with established business protocols and company policies.

**Measurement Criteria:** Communicate company policies to customers.

**Measurement Criteria:** Handle merchandise returns in accordance with customer service policy.

**Measurement Criteria:** Handle customer complaints in accordance with customer service policy.

**Measurement Criteria:** Facilitate customer service through the maintenance of key information systems.

Performance Element: Ensure that customers’ needs are met and that customer base is maintained.

**Measurement Criteria:** Follow through on commitments made to customers (e.g., special orders, delivery specifications, new items).

**Measurement Criteria:** Maintain customer base.

Statement: Perform scheduling functions to meet customers needs.

Performance Element: Schedule customer appointments.

**Measurement Criteria:** Create calendars/schedules.

**Measurement Criteria:** Maintain appointment calendars.

**Measurement Criteria:** Process requests for appointments.

**Measurement Criteria:** Verify appointments.

**Measurement Criteria:** Notify customers of changes in schedule.

**Measurement Criteria:** Manage scheduling conflicts.

Performance Element: Document results of customer appointments.

**Measurement Criteria:** Document results.
Cluster Knowledge and Skill Statement

Problem Solving and Critical Thinking

Statement: Guide progress in assigned areas of responsibility/accountability.

Performance Element: Set goals.
  
  **Measurement Criteria:** Set short- and long-term goals for assigned areas of responsibility/accountability.
  
  **Measurement Criteria:** Demonstrate commitment to established goals and vision.

Performance Element: Monitor and adjust goals.
  
  **Measurement Criteria:** Obtain support for goals.
  
  **Measurement Criteria:** Provide support for goals.
  
  **Measurement Criteria:** Monitor goal achievement.
  
  **Measurement Criteria:** Adjust goals.

Performance Element: Communicate and recognize goal achievement.
  
  **Measurement Criteria:** Communicate goal achievement.
  
  **Measurement Criteria:** Provide recognition for goal achievement.

Statement: Conduct technical research.

Performance Element: Determine audience and information needs.
  
  **Measurement Criteria:** Identify target audience.
  
  **Measurement Criteria:** Define research questions.

Performance Element: Gather information.
  
  **Measurement Criteria:** Determine priorities for the information that should be gathered.
  
  **Measurement Criteria:** Identify potential sources of information.
  
  **Measurement Criteria:** Target audience/user group as a key information source.
  
  **Measurement Criteria:** Identify subject-matter experts.
  
  **Measurement Criteria:** Evaluate potential sources of information based on established criteria (e.g., affordability, relevance).
  
  **Measurement Criteria:** Conduct interviews with selected human information sources.
  
  **Measurement Criteria:** Gather information from selected print and electronic sources.

Performance Element: Evaluate information.
  
  **Measurement Criteria:** Determine the accuracy and completeness of the information gathered.

Statement: Produce a quality product/service.

Performance Element: Understand product/service design.
  
  **Measurement Criteria:** Design product (e.g., using brainstorming, thumbnail sketches, rendering).
  
  **Measurement Criteria:** Consider customer satisfaction in determining product characteristics (e.g., usefulness, price, operation, life, reliability, safety, cost of operation).
Information Technology

Cluster Knowledge and Skill Statement

Performance Element: Use reliability factors effectively to plan for and create products/services.
  
  **Measurement Criteria:** Consider reliability factors (e.g., cost, human, producibility).

  **Measurement Criteria:** Achieve reliability through maintainability, good design, design simplification, and design redundancy.

  **Measurement Criteria:** Recognize the relationship of maintainability and reliability.

  **Measurement Criteria:** Align cost components with quality objectives.

  **Measurement Criteria:** Classify quality costs (e.g., preventive, evaluation, pre-delivery failures, post-delivery failures).

Performance Element: Test and maintain products/services.

  **Measurement Criteria:** Test products for reliability.

  **Measurement Criteria:** Initiate predictive maintenance procedures.

Statement: Demonstrate knowledge of the process required to evaluate and verify the nature of a problem.

Performance Element: Understand information systems theory and practice.

  **Measurement Criteria:** Demonstrate knowledge of the underlying concepts of the information systems discipline.

  **Measurement Criteria:** Demonstrate knowledge of methods for achieving productivity in knowledge work.

  **Measurement Criteria:** Apply general systems theory to the analysis and development of an information system.

  **Measurement Criteria:** Identify procedures for formal problem solving.

  **Measurement Criteria:** Demonstrate knowledge of the fundamental concept of information theory and organizational system processes.

  **Measurement Criteria:** Identify the essential properties of information systems.

Statement: Demonstrate knowledge of the process required to solve a problem.

Performance Element: Understand information systems problem solving techniques and approaches.

  **Measurement Criteria:** Demonstrate knowledge of problem-solving steps and techniques.

  **Measurement Criteria:** Summarize application planning, development, and risk management for information system.

  **Measurement Criteria:** Identify potential problems in system implementation.

  **Measurement Criteria:** Demonstrate knowledge of the information analysis process.

  **Measurement Criteria:** Demonstrate knowledge of information technology solutions.

Statement: Demonstrate an ability to evaluate and verify the appropriateness of a solution to a problem.

Performance Element: Evaluate information systems problem solving techniques and approaches.

  **Measurement Criteria:** Demonstrate knowledge of decision-making skills and techniques.

  **Measurement Criteria:** Demonstrate knowledge of critical thinking skills and techniques.

  **Measurement Criteria:** Summarize application planning, development, and risk management for information system.

  **Measurement Criteria:** Identify potential problems in system implementation.

  **Measurement Criteria:** Determine whether prototyping system is feasible.
Cluster Knowledge and Skill Statement

**Measurement Criteria:** Develop a plan using data-oriented techniques.

**Measurement Criteria:** Evaluate systems engineering considerations.

**Measurement Criteria:** Determine software design process, from specification to implementation.

**Measurement Criteria:** Appraise software process and product life-cycle models.

**Measurement Criteria:** Assess software design methods and tools.

**Statement:** Demonstrate knowledge of information organization principles.

Performance Element: Understand information organization principles.

**Measurement Criteria:** Demonstrate knowledge of group support technology for common knowledge requirements.

**Measurement Criteria:** Demonstrate knowledge of the information analysis process.

**Measurement Criteria:** Demonstrate knowledge of information technology solutions.

**Measurement Criteria:** Demonstrate knowledge of methods for achieving productivity in knowledge work.

**Statement:** Demonstrate knowledge of design principles.

Performance Element: Understand and employ design and color principles.

**Measurement Criteria:** Demonstrate knowledge of the two-dimensional picture plan.

**Measurement Criteria:** Demonstrate knowledge of the principles and elements of design and their relationship to each other.

**Measurement Criteria:** Demonstrate knowledge of the nature of color and color harmonies.

**Measurement Criteria:** Assess the impact of various color harmonies on a two-dimensional picture plan.

**Measurement Criteria:** Assess how color affects the principles of line, value, shape and form.
Cluster Knowledge and Skill Statement

Information Technology Applications

**Statement: Use Personal information Management (PIM)/ Productivity applications.**

Performance Element: Manage personal schedule and contact information.

**Measurement Criteria:** Identify PIM applications such as MS Outlook, Lotus Notes, and others.

**Measurement Criteria:** Create tasks (to-do) list.

**Measurement Criteria:** Manage daily/weekly/monthly schedule using applications such as Notes, MS Outlook, etc.

Performance Element: Create memos and notes.

**Measurement Criteria:** Create reminder for oneself.

**Measurement Criteria:** Create and send notes, informal memos, reminder using PIM applications such as Lotus Notes, MS Outlook, and others.

**Statement: Use Electronic Mail applications.**

Performance Element: Use email to communicate within and across organizations.

**Measurement Criteria:** Access email system using login and password functions.

**Measurement Criteria:** Access email messages received.

**Measurement Criteria:** Create e-mail messages in accordance with established business standards (e.g., grammar, word usage, spelling, sentence structure, clarity, e-mail etiquette).

**Measurement Criteria:** Demonstrate knowledge of e-mail etiquette.

**Measurement Criteria:** Send e-mail messages.

Performance Element: Use email to share files and documents.

**Measurement Criteria:** Access email attachments.

**Measurement Criteria:** Attach documents to messages.

**Measurement Criteria:** Save email messages/attachments.

**Measurement Criteria:** Demonstrate knowledge of contamination protection strategies for email.

**Statement: Use Internet Applications.**

Performance Element: Search for information and resources.

**Measurement Criteria:** Select search engine(s) to use.

**Measurement Criteria:** Select appropriate search procedures and approaches.

**Measurement Criteria:** Locate information using search engine(s) and Boolean logic.

**Measurement Criteria:** Navigate web sites using software functions.

Performance Element: Access and evaluate Internet resources.

**Measurement Criteria:** Access business and technical information using the Internet.

**Measurement Criteria:** Access commercial, government, and education resources.

**Measurement Criteria:** Evaluate Internet resources (e.g., accuracy of information).

**Statement: Use Writing/Publishing applications.**

Performance Element: Prepare simple documents and other business communications.

**Measurement Criteria:** Retrieve existing documents.

**Measurement Criteria:** Create documents (e.g., letters, memos, reports) using existing forms and templates.

**Measurement Criteria:** Safeguard documents using name and save functions.
Cluster Knowledge and Skill Statement

**Information Technology**

*Measurement Criteria:* Format text using basic formatting functions.

*Measurement Criteria:* Employ word processing utility tools (e.g., spell checker, grammar checker, thesaurus).

**Performance Element:** Prepare reports and other business communications, integrating graphics and other non-text elements.

*Measurement Criteria:* Use advanced formatting features (e.g., headers/footers/dropped caps, indexing).

*Measurement Criteria:* Place graphics in document.

*Measurement Criteria:* Enhance publications using different fonts, styles, attributes, justification, etc.

*Measurement Criteria:* Enhance publications using paint/draw functions.

**Performance Element:** Prepare complex publications.

*Measurement Criteria:* Create new word processing forms, style sheets, and templates.

*Measurement Criteria:* Prepare publications using desktop publishing software.

*Measurement Criteria:* Format new desktop publishing files.

*Measurement Criteria:* Output desktop publishing files.

**Statement:** Use Presentation applications.

**Performance Element:** Prepare presentations for training, sales and information sharing.

*Measurement Criteria:* Create computer presentation and handouts in accordance with basic principles of graphics design and visual communication.

*Measurement Criteria:* Insert graphic elements (e.g., graph, clip art, table) in a slide.

*Measurement Criteria:* Edit presentations.

**Performance Element:** Deliver presentations, with supporting materials.

*Measurement Criteria:* Identify hardware items that support presentation software (e.g., scanners, digital cameras, printers, and projection systems).

*Measurement Criteria:* Print a single slide, an entire presentation, an outline, and notes.

*Measurement Criteria:* Run slide shows manually and automatically.

**Statement:** Use Spreadsheet applications.

**Performance Element:** Create a spreadsheet.

*Measurement Criteria:* Create spreadsheets.

*Measurement Criteria:* Retrieve existing spreadsheets.

*Measurement Criteria:* Edit spreadsheets.

*Measurement Criteria:* Save spreadsheets.

*Measurement Criteria:* Print spreadsheets

**Performance Element:** Perform calculations and analysis on data.

*Measurement Criteria:* Group worksheets.

*Measurement Criteria:* Create charts and graphs from spreadsheets.

*Measurement Criteria:* Perform calculations using simple formulas.


**Statement:** Use Database applications

**Performance Element:** Manipulate data elements.

*Measurement Criteria:* Enter data using a form.

*Measurement Criteria:* Locate/replace data using search and replace functions.
Information Technology

Cluster Knowledge and Skill Statement

**Measurement Criteria:** Process data using database functions (e.g., structure, format, attributes, relationships, keys)

**Performance Element:** Manage, analyze and report on interrelated data elements.

**Measurement Criteria:** Search a database table to locate records.

**Measurement Criteria:** Sort data using single- and multiple-field sorts.

**Measurement Criteria:** Perform single- and multiple-table queries (e.g., create, run, save).

**Measurement Criteria:** Print forms, reports, and results of queries.

**Measurement Criteria:** Verify accuracy of output.

**Statement:** Use Collaborative/Groupware applications.

**Performance Element:** Facilitate group work through management of shared schedule and contact information.

**Measurement Criteria:** Manage daily/weekly/monthly schedule using applications.

**Measurement Criteria:** Maintain shared database of contact information.

**Performance Element:** Facilitate group work through management of shared files and online information.

**Measurement Criteria:** Organize, store, and share files in network directories.

**Measurement Criteria:** Organize, store, and share files using web sites.

**Measurement Criteria:** Organize, store, and share files using document libraries or databases.

**Performance Element:** Facilitate group work through instant messaging or virtual meetings.

**Measurement Criteria:** Participate in virtual group discussions and meetings.

**Statement:** Use Computer Operations applications.

**Performance Element:** Manage computer operations.

**Measurement Criteria:** Apply basic commands of operating system software.

**Measurement Criteria:** Employ desktop operating skills.

**Performance Element:** Manage file storage.

**Measurement Criteria:** Apply appropriate file and disk management techniques.

**Measurement Criteria:** Differentiate between files and directories.

**Measurement Criteria:** Determine file organization.

**Measurement Criteria:** Demonstrate knowledge of the system utilities used for file management.

**Performance Element:** Compress or alter files.

**Measurement Criteria:** Convert file formats.

**Measurement Criteria:** Unpack files using compression software.

**Measurement Criteria:** Convert existing files.

**Statement:** Use Computer-based Equipment (containing embedded computers (or processors) used to control electromechanical devices).

**Performance Element:** Operate computer driven equipment and machines.

**Measurement Criteria:** Secure needed supplies and resources.

**Measurement Criteria:** Follow power-up and log-on procedures.

**Measurement Criteria:** Interact with/respond to system messages using console device.

**Measurement Criteria:** Run applications/jobs in accordance with processing procedures.
Cluster Knowledge and Skill Statement

**Performance Element:** Follow log-off and power-down procedure(s).

**Measurement Criteria:** Use installation and operation manuals.

**Performance Element:** Use installation and operation manuals.

**Measurement Criteria:** Access needed information using appropriate reference materials.

**Performance Element:** Troubleshoot computer driven equipment and machines and access support as needed.

**Measurement Criteria:** Test system using diagnostic tools/software.

**Measurement Criteria:** Repair/replace malfunctioning hardware.

**Measurement Criteria:** Reinstall software as needed.

**Measurement Criteria:** Recover data and/or files.

**Measurement Criteria:** Restore system to normal operating standards.
Cluster Knowledge and Skill Statement

**Systems**

**Statement: Characterize the nature of business.**

- **Performance Element:** Understand types and functions of businesses.
  - **Measurement Criteria:** Identify types of business organizations and functions.
  - **Measurement Criteria:** Identify business reporting and information flow.
  - **Measurement Criteria:** Define stakeholder relationships (e.g., customers, employees, shareholders, and suppliers).

- **Performance Element:** Understand functions and interactions of departments within a business.
  - **Measurement Criteria:** Demonstrate knowledge of the components of a business plan.
  - **Measurement Criteria:** Identify the ways in which organizational functions are interdependent.
  - **Measurement Criteria:** Identify types of communication channels (e.g., formal, informal).
  - **Measurement Criteria:** Define the role of strategic planning in business.

**Statement: Demonstrate knowledge of the nature of IT in business.**

- **Performance Element:** Understand the functions of information systems in business.
  - **Measurement Criteria:** Determine how business activities interface with data processing functions.
  - **Measurement Criteria:** Differentiate between the role of information systems within a company and their role in a global environment.
  - **Measurement Criteria:** Measure increases in productivity realized by the implementation of information systems.

**Statement: Demonstrate knowledge of the operation of cross-functional teams in achieving project goals.**

- **Performance Element:** Understand the importance of cross-functional teams in achieving IT project goals.
  - **Measurement Criteria:** Consider the benefits of using a cross-functional team in policy and procedure development.
  - **Measurement Criteria:** Identify desired group and team behavior in an IS context.

**Statement: Explain/discuss general strategies for maximizing organizational learning and productivity in a high tech environment.**

- **Performance Element:** Understand strategies for maximizing productivity in a high tech environment.
  - **Measurement Criteria:** Assess the importance of new technologies to future developments and to the future knowledge worker productivity.
  - **Measurement Criteria:** Demonstrate knowledge of methods for achieving productivity in knowledge work.
  - **Measurement Criteria:** Create/maintain an environment supportive of productivity.
Cluster Knowledge and Skill Statement

Safety, Health, and Environmental

Statement: Maintain a safe working environment.

Performance Element: Understand health and safety standards and concepts in the workplace.

Measurement Criteria: Demonstrate knowledge of the relationship between health, safety, and productivity.

Measurement Criteria: Identify health and safety standards established by government agencies.

Measurement Criteria: Access needed safety information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, and flowcharts).

Measurement Criteria: Ensure maintenance of a clean work area.

Measurement Criteria: Solve safety problems using problem solving, decision-making, and critical thinking strategies.

Measurement Criteria: Demonstrate knowledge of ergonomics and repetitive strain injury.
Leadership and Teamwork

Statement: Demonstrate knowledge of the skills needed for leadership in the IT environment.

Performance Element: Understand key approaches to successful leadership in the IT environment.

Measurement Criteria: Demonstrate knowledge of how to apply team methods to empower coworkers.

Measurement Criteria: Establish goals and objectives for IS.

Measurement Criteria: Define mission and critical success factors.

Measurement Criteria: Identify desired group and team behavior in an IS context.

Statement: Build interpersonal skills with individuals and other team members.

Performance Element: Understand best practices for successful team functioning.

Measurement Criteria: Analyze the interdependence of empathetic listening, synergy, and consensus building.

Measurement Criteria: Define roles within the group decision-making process.

Measurement Criteria: Demonstrate knowledge of how to apply team methods to empower coworkers.

Performance Element: Apply best practices for successful team functioning.

Measurement Criteria: Apply knowledge of group dynamics.

Measurement Criteria: Promote teamwork, leadership, and empowerment.

Measurement Criteria: Identify strategies for fostering creativity.
Cluster Knowledge and Skill Statement

Ethics and Legal Responsibilities

Statement: Demonstrate appropriate knowledge and behaviors of legal responsibilities and of positive cyber-citizenry.

Performance Element: Understand legal issues faced by IT professionals.

Measurement Criteria: Demonstrate knowledge of the legal issues that face information technology professionals.

Measurement Criteria: Identify issues and trends affecting computers and information privacy.

Statement: Demonstrate knowledge of the rights and responsibilities of IT workers.

Performance Element: Understand the rights and responsibilities of IT workers.

Measurement Criteria: Identify generally accepted business ethics.

Measurement Criteria: Demonstrate knowledge of federal laws governing discrimination and harassment.

Measurement Criteria: Demonstrate knowledge of key concepts related to employment discrimination.

Measurement Criteria: Demonstrate sensitivity to diversity, including differences in gender, culture, race, language, physical and mental challenges, and family structures.

Measurement Criteria: Establish procedures for maintaining the confidentiality of client information.

Statement: Demonstrate knowledge of social, ethical, and legal issues in the information technology field.

Performance Element: Understand ethical issues in the IT field.

Measurement Criteria: Analyze the social implications of decisions made and actions taken as an information technology professional.

Measurement Criteria: Demonstrate knowledge of the ethical issues that face information technology professionals.

Performance Element: Understand legal issues in the IT field.

Measurement Criteria: 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.

Measurement Criteria: Demonstrate knowledge of basic business law concepts.
Cluster Knowledge and Skill Statement

Employability and Career Development

Statement: Explain written organizational policies, rules and procedures to help employees perform their jobs.

Performance Element: Locate appropriate information on organizational policies in handbooks and manuals.

Measurement Criteria: Identify the contents of various organizational publications.

Measurement Criteria: Determine the appropriate document(s) for specific job responsibilities and work assignments.

Performance Element: Discuss how specific organizational policies and rules influence a specific work situation.

Measurement Criteria: Locate and identify specific organizational policy, rule or procedure to assist with a given situation.

Measurement Criteria: Articulate how a specific organizational policy, rule or procedure will improve a given situation.

Statement: Identify and demonstrate positive work behaviors and personal qualities.

Performance Element: Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.

Measurement Criteria: Demonstrate regular attendance.

Measurement Criteria: Follow company dress and appearance standards.

Measurement Criteria: Exhibit pride in work.

Measurement Criteria: Demonstrate leadership and teamwork.

Performance Element: Demonstrate flexibility and willingness to learn new knowledge and skills.

Measurement Criteria: Exhibit ability to handle stress.

Measurement Criteria: Display initiative and open-mindedness.

Measurement Criteria: Participate in company orientation and training programs with enthusiasm.

Measurement Criteria: Identify progressive strategies that will impact efficiency of job.

Performance Element: Exhibit commitment to the organization.

Measurement Criteria: Follow established rules, regulations and policies.

Measurement Criteria: Explain employer/management responsibilities.

Measurement Criteria: Demonstrate cost effectiveness.

Measurement Criteria: Demonstrate time management.

Measurement Criteria: Complete all tasks thoroughly.

Statement: Identify and explore career opportunities in one or more career pathways.

Performance Element: Locate and identify career opportunities that appeal to personal career goals.

Measurement Criteria: Locate and interpret career information for at least one career cluster.

Measurement Criteria: Identify job requirements for three career pathways.

Measurement Criteria: Identify educational and credentialing requirements for three careers.
Cluster Knowledge and Skill Statement

**Information Technology**

**Performance Element:** Match personal interests and aptitudes to selected careers.

**Measurement Criteria:**
- 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.

**Statement:** Develop a personal career plan to meet career goals and objectives.

**Performance Element:** Develop career goal and objectives to plan future career direction.

**Measurement Criteria:**
- Identify career that matches individual interests and aptitudes.
- Develop career goal with time frame.
- Identify goals and objectives for reaching and advancing in career.

**Performance Element:** Develop strategies to reach career objectives.

**Measurement Criteria:**
- 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.

**Statement:** Demonstrate ability to seek and apply for employment.

**Performance Element:** Use multiple resources to locate job opportunities.

**Measurement Criteria:**
- 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.

**Performance Element:** Prepare a resume and letter of application to apply.

**Measurement Criteria:**
- Identify respective 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.

**Performance Element:** Complete an employment application to obtain employment.

**Measurement Criteria:**
- 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.
- Submit full application package to employers.
Information Technology

Cluster Knowledge and Skill Statement

Performance Element: Interview to obtain employment.
- Measurement Criteria: Dress appropriately for interview.
- Measurement Criteria: Exhibit professional conduct before, during and after interview.
- Measurement Criteria: Explain your qualifications and interests clearly and concisely.
- Measurement Criteria: Answer all questions honestly and concisely.
- Measurement Criteria: Write follow-up letter after the interview.

Statement: Demonstrate ability to evaluate and compare employment opportunities and accept employment.

Performance Element: Evaluate and compare employment opportunity to individual needs and career plan.
- Measurement Criteria: Identify job advantages and disadvantages.
- Measurement Criteria: Compare job benefits to individual needs.
- Measurement Criteria: Compare job opportunities and responsibilities to career plan.

Performance Element: Accept or reject employment.
- Measurement Criteria: Make decision to accept or reject employment.
- Measurement Criteria: Write acceptance or rejection letter without error.
- Measurement Criteria: Complete employment forms upon acceptance.

Statement: Provide examples of how IT is transforming business in various industries.

Performance Element: Understand the impact of IT on business.
- Measurement Criteria: Demonstrate knowledge of how both PCs and larger computer systems impact people and are used in business/industry/government and other institutions.
- Measurement Criteria: Demonstrate knowledge of the impact of computers on career pathways in business/industry (e.g., how computers have eliminated and created jobs).
- Measurement Criteria: Demonstrate knowledge of the impact of computers on access to information and information exchange worldwide.
- Measurement Criteria: Demonstrate knowledge of ethical issues that have surfaced in the information age.

Statement: Demonstrate knowledge of the relationship between lifelong learning and IT career development.

Performance Element: Demonstrate knowledge of IT as a constantly changing and fast growing field.
- Measurement Criteria: Identify present and future IT employment opportunities.
- Measurement Criteria: Demonstrate knowledge of the potential impact of IT on future society.
- Measurement Criteria: Identify the importance of lifelong learning in the IT field.

Performance Element: Identify education and training requirements for selected career pathway.
- Measurement Criteria: Identify certification and/or degree requirements.
- Measurement Criteria: Identify required knowledge and skills for career ladder.
Cluster Knowledge and Skill Statement

Performance Element: Identify education and training opportunities available for selected career pathway.

**Measurement Criteria:** Research educational and training opportunities.

**Measurement Criteria:** Identify present and future IT education and training opportunities.

**Measurement Criteria:** Design a lifelong learning plan that ties in with career advancement plan.

Statement: Demonstrate knowledge of career development/progression patterns in the IT industry.

Performance Element: Identify career development patterns in the IT industry.

**Measurement Criteria:** Identify education and training requirements for IT career pathways.

Performance Element: Identify and understand the benefits of membership in professional IT organizations.

**Measurement Criteria:** Identify professional organizations in the area of information technology.

**Measurement Criteria:** Identify benefits derived from membership in specific professional organizations.
Cluster Knowledge and Skill Statement

Technical Skills

Statement: Demonstrate knowledge of the hardware components associated with information systems.

Performance Element: Understand the fundamentals of operating systems.
Measurement Criteria: Identify major operating system fundamentals and components.

Performance Element: Explain the role of number systems in information systems.
Measurement Criteria: Identify the role the binary system in information systems.
Measurement Criteria: Demonstrate knowledge of number systems and internal data representation

Performance Element: Identify computer classifications and hardware.
Measurement Criteria: Identify the three main classifications of computers (i.e., micro-, mid-range, and mainframes).
Measurement Criteria: Identify major hardware components and their functions.
Measurement Criteria: Identify the hardware associated with telecommunications functions.
Measurement Criteria: Identify types of computer storage devices.

Performance Element: Understand elements and types of information processing.
Measurement Criteria: Identify the elements of the information processing cycle (i.e., input, process, output, and storage).
Measurement Criteria: Identify types of processing (e.g., batch, interactive, event-driven, object-oriented).

Performance Element: Use available reference tools as appropriate.
Measurement Criteria: Access needed information using company and manufacturers’ references (e.g., procedural manuals, documentation, standards, work flowcharts).

Statement: Demonstrate knowledge of the classes of software associated with information systems.

Performance Element: Explain the key functions and applications of software.
Measurement Criteria: Demonstrate knowledge of the key functions of systems software.
Measurement Criteria: Demonstrate knowledge of widely used software applications (e.g., word processing, database management, spreadsheet development).
Measurement Criteria: Demonstrate knowledge of the function and operation of compilers and interpreters.

Performance Element: Understand the range of languages used in software development.
Measurement Criteria: Demonstrate knowledge of the range of languages used in software development.

Performance Element: Understand how data is organized in software development.
Measurement Criteria: Demonstrate knowledge of how data is organized in software development.

Performance Element: Explain new and emerging classes of software.
Measurement Criteria: Identify new and emerging classes of software.

Statement: Explore the future of information technologies.

Performance Element: Explain measurement techniques for increased productivity
Cluster Knowledge and Skill Statement

due to information systems implementation.

**Measurement Criteria:** Measure increases in productivity realized by the implementation of information systems.

**Performance Element:** Identify new IT technologies and assess their potential importance and impact in the future.

**Measurement Criteria:** Identify new technologies relevant to information technology.

**Measurement Criteria:** Assess the importance of new technologies to future developments and to future knowledge worker productivity.

**Measurement Criteria:** Identify new and emerging drivers and inhibitors of information technology change.

**Statement:** Demonstrate knowledge of basic data communications components and trends.

**Performance Element:** Explain data communications procedures, equipment and media.

**Measurement Criteria:** Demonstrate knowledge of key communications procedures.

**Measurement Criteria:** Demonstrate knowledge of the uses of data communication equipment.

**Measurement Criteria:** Demonstrate knowledge of types of communications media.

**Performance Element:** Understand data transmission codes and protocols.

**Measurement Criteria:** Demonstrate knowledge of data transmission codes and protocols.

**Performance Element:** Explain the differences between local and wide area networks.

**Measurement Criteria:** Distinguish between local area networks and wide-area networks.

**Performance Element:** Understand data communications trends and issues.

**Measurement Criteria:** Identify data communication trends.

**Measurement Criteria:** Identify major current issues in data communications.

**Statement:** Demonstrate technical knowledge of the Internet.

**Performance Element:** Understand Internet protocols.

**Measurement Criteria:** Demonstrate knowledge of the Transmission Control Protocol/Internet Protocol (TCP/IP) suite.

**Measurement Criteria:** Demonstrate knowledge of Simple Network Management Protocol (SNMP).

**Measurement Criteria:** Demonstrate knowledge of IP forwarding, encapsulation, and fragmentation.

**Performance Element:** Explain Domain Name Server (DNS).

**Measurement Criteria:** Demonstrate knowledge of the Domain Name Server (DNS).

**Performance Element:** Understand Internet security issues and systems available for addressing them.

**Measurement Criteria:** Demonstrate knowledge of Internet security issues.

**Measurement Criteria:** Identify available Internet security systems.

**Statement:** Access the Internet.

**Performance Element:** Use and troubleshoot Internet connection.

**Measurement Criteria:** Connect to the Internet.

**Measurement Criteria:** Test Internet connection.
Cluster Knowledge and Skill Statement

Performance Element: Explain the components of Internet software.
Measurement Criteria: Demonstrate knowledge of the components of Internet software.

Performance Element: Install and use Internet software.
Measurement Criteria: Explore browser features.
Measurement Criteria: Install Internet software.
Measurement Criteria: Download free software upgrades and shareware from the Internet.

Performance Element: Understand virus protection procedures.
Measurement Criteria: Demonstrate acute awareness of virus protection techniques.

Statement: Utilize Internet services.

Performance Element: Use web browser software.
Measurement Criteria: Navigate web sites using software functions (e.g., Forward, Back, Go To, Bookmarks).
Measurement Criteria: Bookmark web addresses (URLs).

Performance Element: Apply search procedures to locate information on the Internet.
Measurement Criteria: Select search engine(s) to use.
Measurement Criteria: Select appropriate search procedures and approaches.
Measurement Criteria: Locate information using search engine(s) and Boolean logic.

Performance Element: Obtain, compile and evaluate information from the Internet.
Measurement Criteria: Access business and technical information using the Internet.
Measurement Criteria: Access commercial, government, and education resources.
Measurement Criteria: Compile a collection of business sites (e.g., finance and investment).
Measurement Criteria: Evaluate Internet resources (e.g., accuracy of information).

Performance Element: Install and download software from the Internet.
Measurement Criteria: Download files from FTP archives.
Measurement Criteria: Retrieve online tools.
Measurement Criteria: Download/convert Internet programming files.
Measurement Criteria: Add plug-ins and helpers to the web browser.
Measurement Criteria: Archive files.

Performance Element: Use the Internet to communicate and collaborate.
Measurement Criteria: Communicate via e-mail using the Internet.
Measurement Criteria: Subscribe to mailing lists.
Measurement Criteria: Participate in newsgroups.
Measurement Criteria: Explore collaboration tools.
Measurement Criteria: Participate in online audio and video conferencing.
Measurement Criteria: Explore electronic commerce.

Statement: Install and configure software programs.

Performance Element: Ensure that hardware and software system components are
Cluster Knowledge and Skill Statement

compatible prior to performing installation.

**Measurement Criteria:** Identify hardware requirements (e.g., processor, memory, disk space, communications, printers, monitors).

**Measurement Criteria:** Determine compatibility of hardware and software.

**Performance Element:** Ensure that software to be installed is licensed prior to performing installation.

**Measurement Criteria:** Verify conformance to licensing agreement.

**Performance Element:** Perform installation accurately and completely, using available resources as needed.

**Measurement Criteria:** Install given application/system software on various platforms in accordance with manufacturer's procedures.

**Measurement Criteria:** Disable/uninstall software that may interfere with installation of new software.

**Measurement Criteria:** Differentiate between procedures for an upgrade and for a new installation.

**Measurement Criteria:** Differentiate between stand-alone and network installation procedures.

**Measurement Criteria:** Select appropriate installation options (e.g., default, customized).

**Measurement Criteria:** Configure software to appropriate operating system settings.

**Measurement Criteria:** Configure macros, tools, and packages to accomplish simple organizational and personal tasks.

**Measurement Criteria:** Convert data files if required.

**Measurement Criteria:** Verify software installation and operation

**Performance Element:** Resolve problems with installation if they occur.

**Measurement Criteria:** Troubleshoot unexpected results.

**Measurement Criteria:** Access needed help using manufacturers' technical help lines or Internet sites.

**Measurement Criteria:** Formulate new installation procedure if needed.

**Performance Element:** Perform customization as requested.

**Measurement Criteria:** Customize software to meet user preferences.

**Performance Element:** Clearly document procedures for future use.

**Measurement Criteria:** Document step-by-step installation and configuration procedures.

**Statement:** Demonstrate knowledge of web page basics.

**Performance Element:** Explain the features and functions of web browsing software.

**Measurement Criteria:** Demonstrate knowledge of the role of browsers in reading files on the World Wide Web (text-only, hypertext).

**Measurement Criteria:** Identify how different browsers affect the look of a web page.

**Measurement Criteria:** Demonstrate knowledge of the characteristics and uses of plug-ins.

**Performance Element:** Explain the features and functions of web page design software.

**Measurement Criteria:** Compare/contrast the features and functions of software editors available for designing web pages.
Cluster Knowledge and Skill Statement

**Performance Element:** Understand the differences between a client and a server.

**Measurement Criteria:** Differentiate between a client and a server.

**Performance Element:** Understand how bandwidth affects data transmission and on-screen image.

**Measurement Criteria:** Demonstrate knowledge of how bandwidth affects data transmission and on-screen image.

**Performance Element:** Explain the benefits of hosting a web site on a local server vs. at an ISP (Internet Service Provider).

**Measurement Criteria:** Compare the advantages and disadvantages of running your own server vs. using a server provider.

**Statement:** Operate system.

**Performance Element:** Configure/modify system as needed.

**Measurement Criteria:** Secure needed supplies and resources.

**Measurement Criteria:** Review automated scheduling software.

**Measurement Criteria:** Identify data requirements.

**Measurement Criteria:** Identify scheduling priority in programming.

**Measurement Criteria:** Build system software command structures using operating system macro facilities for computer systems.

**Performance Element:** Apply knowledge of operating systems principles to ensure optimal functioning of system.

**Measurement Criteria:** Apply basic commands of operating system software.

**Measurement Criteria:** Apply appropriate file and disk management techniques.

**Measurement Criteria:** Employ desktop operating skills.

**Measurement Criteria:** Handle materials and equipment in a responsible manner.

**Measurement Criteria:** Follow power-up and log-on procedures.

**Measurement Criteria:** Interact with/respond to system messages using console device.

**Measurement Criteria:** Run applications/jobs in accordance with processing procedures.

**Measurement Criteria:** Follow log-off and power-down procedure(s).

**Performance Element:** Use available reference tools as appropriate.

**Measurement Criteria:** Access needed information using appropriate reference materials.

**Performance Element:** Document procedures and actions.

**Measurement Criteria:** Develop audit trails.

**Statement:** Perform standard computer backup procedures.

**Performance Element:** Explain the need for regular backup procedures.

**Measurement Criteria:** Recognize the need for regular backup procedures.

**Performance Element:** Configure & maintain backup system.

**Measurement Criteria:** Load backup software.

**Measurement Criteria:** Load compression drive backup software.

**Measurement Criteria:** Install surge suppression protection.

**Measurement Criteria:** Identify battery backup equipment.

**Measurement Criteria:** Maintain battery backup system.
Information Technology

Cluster Knowledge and Skill Statement

Performance Element: Perform backup procedures.
   Measurement Criteria: Perform restore operation using backup software.
   Measurement Criteria: Perform restore operation using compression drive backup software.

Statement: Describe system components.

Performance Element: Understand CPUs.
   Measurement Criteria: Demonstrate knowledge of central processing unit (CPU) control and architecture.
   Measurement Criteria: Identify CPU modes of operations.

Performance Element: Understand operating systems.
   Measurement Criteria: Demonstrate knowledge of operating system architecture types.
   Measurement Criteria: Identify operating system goals.
   Measurement Criteria: Demonstrate knowledge of operating system structuring methods, layered models, and the object-server model.
   Measurement Criteria: Differentiate between microcomputer, minicomputer, and mainframe operating systems.
   Measurement Criteria: Demonstrate knowledge of network operating systems.
   Measurement Criteria: Define the role of memory management in an operating system.
   Measurement Criteria: Demonstrate knowledge of the commands used to handle tasks in operating systems.
   Measurement Criteria: Demonstrate knowledge of interface theory in an operating system.

Performance Element: Understand the fundamentals of operating systems.
   Measurement Criteria: Demonstrate knowledge of the basics of process management.
   Measurement Criteria: Demonstrate knowledge of the system utilities used for file management.

Statement: Maintain security requirements.

Performance Element: Understand potential security threats to information systems.
   Measurement Criteria: Demonstrate knowledge of potential internal and external threats to security.

Performance Element: Assess security threats and develop plan to address.
   Measurement Criteria: Maximize threat reduction.
   Measurement Criteria: Assess exposure to security issues.
   Measurement Criteria: Implement countermeasures.
   Measurement Criteria: Ensure compliance with security rules, regulations, and codes.
   Measurement Criteria: Demonstrate knowledge of virus protection strategy.
   Measurement Criteria: Implement security procedures in accordance with business ethics.
Performance Element: Implement and document security procedures.

**Measurement Criteria:** Maintain confidentiality.
**Measurement Criteria:** Load virus detection and protection software.
**Measurement Criteria:** Identify sources of virus infections.
**Measurement Criteria:** Remove viruses.
**Measurement Criteria:** Report viruses in compliance with company standards.
**Measurement Criteria:** Implement backup and recovery procedures.
**Measurement Criteria:** Follow disaster plan.
**Measurement Criteria:** Provide for user authentication (e.g., assign passwords, access level).
**Measurement Criteria:** Document security procedures.

Statement: Employ computer system interfaces.

Performance Element: Configure systems to provide optimal system interfaces.

**Measurement Criteria:** Define hardware-software interface issues for a computer system.
**Measurement Criteria:** Identify standards and issues related to I/O programming and design of I/O interfaces.
**Measurement Criteria:** Interface peripheral devices/controllers in the computer system (e.g., software and hardware interrupts, exceptions, Direct Memory Addressing [DMA], bus structures).
**Measurement Criteria:** Apply concepts of privileged instructions and protected mode programming.
**Measurement Criteria:** Configure peripheral device drivers (e.g., disk, display, printer, modem, keyboard, mouse, network).
**Measurement Criteria:** Apply advanced I/O concepts (e.g., disk caching, data compression, extended memory, magnetic disk/CD-ROM storage and formats).
**Measurement Criteria:** Allocate disk space, non-sharable resources, and I/O devices.

Statement: Maintain system

Performance Element: Implement queries and reports to provide access to critical system information.

**Measurement Criteria:** Create a query to extract information from a file.
**Measurement Criteria:** Create a query to extract information from multiple files.
**Measurement Criteria:** Create reports from queries.
**Measurement Criteria:** Create and use logical files.
**Measurement Criteria:** Develop a display screen for use with high-level language program.
**Measurement Criteria:** Access needed information using appropriate reference materials.
Cluster Knowledge and Skill Statement

Performance Element: Ensure that system is functioning optimally.
- **Measurement Criteria**: Monitor system status and performance.
- **Measurement Criteria**: Run diagnostics.
- **Measurement Criteria**: Respond to system messages.
- **Measurement Criteria**: Perform preventive maintenance procedures on computer and peripheral devices.
- **Measurement Criteria**: Handle materials and equipment in a responsible manner.
- **Measurement Criteria**: Optimize windows environment to maximize performance of desktop resources.
- **Measurement Criteria**: Review automated scheduling software.

Performance Element: Fix and document system problems.
- **Measurement Criteria**: Fix recoverable problems.
- **Measurement Criteria**: Restore system.
- **Measurement Criteria**: Document computer system malfunction(s).
- **Measurement Criteria**: Document software malfunction(s).

Statement: Provide support and training.

Performance Element: Provide Help Desk service to computer users within the organization.
- **Measurement Criteria**: Operate help desk.
- **Measurement Criteria**: Employ desktop productivity tools.
- **Measurement Criteria**: Support computer users.

Performance Element: Provide training.
- **Measurement Criteria**: Train computer users.

Performance Element: Ensure that network is functioning within specification.
- **Measurement Criteria**: Support Network Operating Center (NOC).
- **Measurement Criteria**: Demonstrate knowledge of the operations of Network Operating Center (NOC).

Statement: Demonstrate a basic knowledge of quality assurance concepts.

Performance Element: Explain the history and standards of key quality management initiatives.
- **Measurement Criteria**: Demonstrate knowledge of the historical evolution of quality assurance/total quality management (e.g., Deming, ISO 9000).
- **Measurement Criteria**: Demonstrate knowledge of changes brought about by quality leaders in the world.
- **Measurement Criteria**: Demonstrate knowledge of the ISO 9000 process.
- **Measurement Criteria**: Demonstrate knowledge of the standards/requirements for the Baldrige award.
- **Measurement Criteria**: Demonstrate knowledge of successful efforts by industry to improve quality and/or reduce costs.

Performance Element: Explain the terminology, role and benefits of quality within an organization.
- **Measurement Criteria**: Demonstrate knowledge of quality management terminology.
- **Measurement Criteria**: Identify the role of quality within the organization.
- **Measurement Criteria**: Identify the features and benefits of quality planning.
Performance Element: Explain the elements of a quality management system.

**Measurement Criteria:** Demonstrate knowledge of the control devices used in functional areas (e.g., SPC, equipment).

**Measurement Criteria:** Demonstrate knowledge of the relationship among organizational structures, policies, procedures, and quality assurance.

**Measurement Criteria:** Identify internal and external customers.

**Measurement Criteria:** Differentiate between prevention and detection.

**Measurement Criteria:** Differentiate between variable and attribute data.

**Measurement Criteria:** Identify types of control charts.

**Measurement Criteria:** Demonstrate knowledge of how statistical techniques are used to control quality (e.g., SPC, DOE, CR).