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## ABSTRACT

This document contains Illinois Occupational Skill Standards for occupations in the Information Technology Operate Cluster (help desk support, computer maintenance and technical support technician, systems operator, application and computer support specialist, systems administrator, network administrator, and database administrator). The skill standards define what an individual should know and the expected level of performance required in an occupational setting. The standards focus on the most critical work performances for an occupation or occupational area. Each skill standard contains the following components: performance area, performance skill, skill standard, performance elements, and performance assessment criteria. Following an introduction that explains the standards and their components and includes a performance skill-level matrix, the document contains skill standards for the following areas: (1) monitoring; (2) administration; (3) change management; (4) operations; (5) maintenance; (6) task management; and (7) troubleshooting. Six appendixes include glossaries of information technology operation terms and occupational skill standards terms; lists of members of the Illinois Occupational Skill Standards and Credentialing Council, the Communications Subcouncil, and the Information Technology Operate Cluster Standards Development Committee; and workplace skills standards. (KC)



# ILLINOIS

## OCCUPATIONAL SKILL STANDARDS

# INFORMATION TECHNOLOGY OPERATE CLUSTER

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# **ILLINOIS OCCUPATIONAL SKILL STANDARDS INFORMATION TECHNOLOGY OPERATE CLUSTER**

## **PROJECT STAFF**

### **Communications Subcouncil Chair**

Doug Dougherty  
President  
Illinois Telephone Association

### **State Liaison**

Ronald Engstrom  
Principal Consultant  
Illinois State Board of Education

### **Product Developer for Information Technology Operate Cluster**

Earl Godt  
Spoon River College  
Macomb, IL

## **AGENCY PARTNERS**

Illinois State Board of Education  
Illinois Community College Board  
Illinois Board of Higher Education  
Illinois Department of Commerce and Community Affairs  
Illinois Department of Employment Security

# **ILLINOIS OCCUPATIONAL SKILL STANDARDS**

## **INFORMATION TECHNOLOGY OPERATE CLUSTER**

Endorsed for Illinois  
by the  
Illinois Occupational Skill Standards  
and Credentialing Council

## A MESSAGE FROM THE ILLINOIS OCCUPATIONAL SKILL STANDARDS AND CREDENTIALING COUNCIL

Preparing youth and adults to enter the workforce and to be able to contribute to society throughout their lives is critical to the economy of Illinois. Public and private interest in establishing national and state systems of industry-driven skill standards and credentials is growing in the United States, especially for occupations that require less than a four-year college degree. This interest stems from the understanding that the United States will increasingly compete internationally and the need to increase the skills and productivity of the front-line workforce. The major purpose of skill standards is to promote education and training investment and ensure that this education and training enables students and workers to meet industry standards that are benchmarked to our major international competitors.

The Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) has been working with industry subcouncils, the Illinois State Board of Education and other partnering agencies to adopt, adapt and/or develop skill standards for high-demand occupations. Skill standards products are being developed for a myriad of industries, occupational clusters and occupations. This document represents the collaborative effort of the Communications Subcouncil, and the Information Technology Operate Cluster Standards Development Committee.

These skill standards will serve as a guide to workforce preparation program providers in defining content for their programs and to employers to establish the skills and standards necessary for job acquisition. These standards will also serve as a mechanism for communication among education, business, industry and labor.

We encourage you to review these standards and share your comments. This effort has involved a great many people from business, industry and labor. Comments regarding their usefulness in curriculum and assessment design, as well as your needs for in-service and technical assistance in their implementation are critical to our efforts to move forward and improve the documents.

Questions concerning this document may be directed to:

Ron Engstrom, Illinois State Board of Education (rengstro@isbe.net)

Tricia Broughton, Illinois Community College Board (tbroughton@iccb.state.il.us)

Linda Lafferty, Illinois State Board of Education (llaffert@isbe.net)

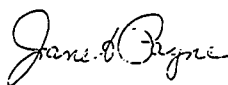
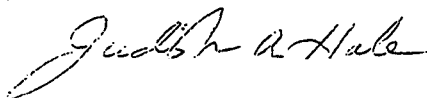
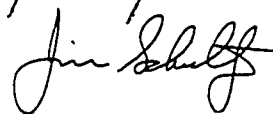
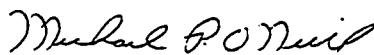
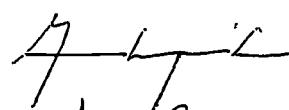
Lyle Neumann, Illinois Department of Employment Security (lneuman@ides.state.il.us)

Mitch Daniels, Illinois Department of Employment Security (mdaniels@ides.state.il.us)

We look forward to your comments.

Sincerely,

The Members of the IOSSCC



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The Occupational Skill Standards Act (PA 87-1210) established the nine-member Illinois Occupational Skill Standards and Credentialing Council (IOSSCC). Members of the IOSSCC represent business, industry and labor and are appointed by the Governor or State Superintendent of Education. The IOSSCC, working with the Illinois State Board of Education, Illinois Community College Board, Illinois Board of Higher Education, Illinois Department of Employment Security and Illinois Department of Commerce and Community Affairs, has created a common vision for workforce development in Illinois.

### **VISION**

**It is the vision of the IOSSCC to develop a statewide system of industry defined and recognized skill standards and credentials for all major skilled occupations providing strong employment and earnings opportunities in Illinois.**

The IOSSCC endorses occupational skill standards and credentialing systems for occupations that

- require basic workplace skills and technical training,
- provide a large number of jobs with either moderate or high earnings, and
- provide career advancement opportunities to related occupations with moderate or high earnings.

### **Subcouncils and Standards Development Committees**

Under the direction of the IOSSCC, and in cooperation with industry organizations and associations, industry subcouncils have been formed to review, approve and promote occupational skill standards and credentialing systems. The industry subcouncils are: Agriculture and Natural Resources; Applied Science and Engineering;\* Business and Administrative Information Services; Communications; Construction;\* Education and Training Services;\* Energy and Utilities;\* Financial Services; Health and Social Services; Hospitality; Legal and Protective Services;\* Manufacturing; Marketing and Retail Trade; and Transportation, Distribution and Logistics. (\*Indicates subcouncils identified for future development.)

Standards development committees are composed of business, labor and education representatives who are experts in the related occupational cluster. They work with the product developer to

- develop or validate occupational skill standards,
- identify related academic skills,
- develop or review assessment or credentialing approaches, and
- recommend endorsement of the standards and credentialing system to the industry subcouncil.

### **Expected Benefits**

The intent of skill standards and credentialing systems is to promote education and training investment and ensure that students and workers are trained to meet industry standards that are benchmarked to the state's major international competitors. Skill standards and credentialing systems have major benefits that impact students and workers, employers and educators in Illinois.

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### **Student and Worker Benefits**

- Help workers make better decisions about the training they need to advance their careers
- Allow workers to communicate more effectively to employers what they know and can do
- Improve long-term employability by helping workers move more easily among work roles
- Enable workers to help their children make effective academic and career and technical decisions

### **Employer Benefits**

- Focus the investment in training and reduce training costs
- Boost quality and productivity and create a more flexible workforce
- Improve employee retention
- Improve supplier performance
- Enlarge the pool of skilled workers

### **Educator Benefits**

- Keep abreast of a rapidly changing workplace
- Contribute to curriculum and program development
- Provide students with better career advice
- Strengthen the relationship between schools and local businesses
- Communicate with parents because educators have up-to-date information about industry needs

The IOSSCC is currently working with the Illinois State Board of Education and other state agencies to integrate the occupational standards with the Illinois Learning Standards which describe what students should know and be able to do as a result of their education. The IOSSCC is also working to integrate workplace skills—problem solving, critical thinking, teamwork, etc.—with both the Illinois Learning Standards and the Illinois Occupational Skill Standards.



# IOSSCC Requirements for Occupational Skill Standards

Illinois Occupational Skill Standards define what an individual should know and the expected level of performance required in an occupational setting. The standards focus on the most critical work performances for an occupation or occupational area.

## Endorsed Occupations

Any occupational skill standards and credentialing system seeking IOSSCC endorsement must

- represent an occupation or occupational cluster that meets the criteria for IOSSCC endorsement, including economic development, earnings potential and job outlook;
- address both content and performance standards for critical work functions and activities for an occupation or occupational area;
- ensure formal validation and endorsement by a representative group of employers and workers within an industry;
- provide for review, modification and revalidation by an industry group a minimum of once every five years;
- award credentials based on assessment approaches that are supported and endorsed by the industry and consistent with nationally recognized guidelines for validity and reliability;
- provide widespread access and information to the general public in Illinois; and
- include marketing and promotion by the industry in cooperation with the partner state agencies.

## Recognized Occupations

Occupations that do not meet the earnings criteria for IOSSCC endorsement but are part of an occupational cluster that is being developed may be presented for recognition by the IOSSCC. IOSSCC members encourage individuals to pursue occupational opportunities identified as endorsed occupations. Examples of occupations that do not meet the endorsement criteria, but have been recognized by the IOSSCC are Certified Nurse Assistant and Physical Therapy Aide.

## Skill Standards Components

Illinois Occupational Skill Standards must contain the following components:

- Performance Area
- Performance Skill
- Skill Standard
- Performance Elements
- Performance Assessment Criteria

The IOSSCC further identified three components (*Conditions of Performance, Work to be Performed and Performance Criteria*) of the Skill Standard component as critical work functions for an occupation or industry/occupational area. The sample format for Illinois Occupational Skill Standards on the following page provides a description of each component of an occupational skill standard.

The sample format also illustrates the coding at the top of each page identifying the state, fiscal year in which standards were endorsed, Subcouncil abbreviation, cluster abbreviation and standard number. For example, the twenty-fifth skill standard in the Information Technology Operate Cluster, which has been developed by the Communications Subcouncil, would carry the following coding: IL.02.COMM.IT/OPER.25.

**SUMMARY OF WORK TO BE PERFORMED. SUMMARY IS BRIEF AND BEGINS WITH AN ACTION VERB.**

IL.FY.SUBCOUNCIL. CLUSTER. STANDARD NO.

**PERFORMANCE AREA**

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

A comprehensive listing of the information, tools, equipment and other resources provided to the person(s) performing the work.

**WORK TO BE PERFORMED**

An overview of the work to be performed in demonstrating the performance skill standard. This overview should address the major components of the performance. The detailed elements or steps of the performance are listed under "Performance Elements."

**PERFORMANCE CRITERIA**

The assessment criteria used to evaluate whether the performance meets the standard. Performance criteria specify product/outcome characteristics (e.g., accuracy levels, appearance, results, etc.) and process or procedure requirements (e.g., safety requirements, time requirements, etc.).

**PERFORMANCE ELEMENTS**

Description of the major elements or steps of the overall performance and any special assessment criteria associated with each element.

**PERFORMANCE ASSESSMENT CRITERIA**

Listing of required testing, certification and/or licensing.

Product and process used to evaluate the performance of the standard.

**PRODUCT**

Description of the product resulting from the performance of the skill standard.

**PROCESS**

Listing of steps from the Performance Elements which must be performed or the required order or performance for meeting the standard.

# OCCUPATIONAL EARNINGS AND EMPLOYMENT INFORMATION FOR INFORMATION TECHNOLOGY OPERATE CLUSTER

## I. Developmental Process and Occupational Definition

### A. Developmental Process

After reviewing the current labor market information, the Communications Subcouncil recommended the development of skill standards for Information Technology. The Subcouncil evaluated initial occupational project work and determined that two separate projects should be completed: one for "Operate" and one for "Design/Build". The identified occupations meet the criteria established by the Illinois Occupational Skill Standards and Credentialing Council (IOSSCC) for performance skill standard development, including education and training requirements, employment and earnings opportunities. A product developer knowledgeable about Information Technology began the process of performance skill identification. The product developer prepared an outline and framework designed to address the major skills expected in the workplace. The framework addresses skill requirements common to the creation and installation of systems hardware and software.

The subcouncil recommended that the final skill standards product be presented to the IOSSCC. The IOSSCC reviewed the skill standards and met with the product developer, state liaison and chair of the subcouncil. Based on the review, the IOSSCC voted to endorse the occupations within the Information Technology Cluster Skill Standards.

#### 1. Resources

Resources used include job descriptions from the *Dictionary of Occupational Titles*; *Bureau of Labor Statistics Standard Occupational Classification*; [acinet.org](http://acinet.org); [CareerJournal.com](http://CareerJournal.com); the ABI database; and [Salary.com](http://Salary.com).

#### 2. Standards Development Committee

The Standards Development Committee was composed of workers from all levels within the Information Technology Cluster. The framework and initial outline of performance skills were addressed and reviewed at an initial meeting. During this time the work titles and skill matrix were accepted and the skills standards were reviewed and revisions suggested. Additional meetings took place and the skills standards, occupational titles and matrix were reviewed and then accepted by the Standards Development Committee. The Communications Subcouncil reviewed and approved the cluster.

### B. Occupational Definition

Information technology (IT) workers are not unique to software and high technology firms; they are as common in the general workplace as in technology-based organizations. The following definition is taken from John Viulami's book, *The World of Information Technology*: "IT encompasses all the technologies used for creating, abstracting, visualizing, presenting, collaborating, communicating, and otherwise 'managing' the flow of information." IT workers are needed for knowledge-based work in all areas of work in companies and organizations involved in every kind of product and service. IT workers are involved in careers such as manufacturing, sales, customer service, and product development and are found in organizations ranging from high-tech industries, such as software development and biotechnology, to service industries, such as banking and insurance.

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### **1. Help Desk Support**

Provides support to end users on a variety of issues. Identifies, researches and resolves technical problems. Responds to telephone calls, email and personnel requests for technical support. Tracks and monitors the problem to ensure a timely resolution. May require an associate's degree in a related area and 0-2 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a supervisor or manager.

### **2. Computer Maintenance/Technical Support Technician**

Maintains, analyzes, troubleshoots and repairs computer systems, hardware and computer peripherals. Documents, maintains, upgrades or replaces hardware and software systems. Supports and maintains user account information including rights, security and systems groups. May require an associate's degree or its equivalent and 0-3 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a project leader or manager.

### **3. System Operator**

Reviews, analyzes and modifies programming systems including encoding, testing, debugging and installing to support an organization's application systems. Consults with users to identify current operating procedures and to clarify program objectives. May require an associate's degree in a related area and 0-3 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision. Typically reports to a project leader or manager.

### **4. Application/Computer Support Specialist**

Reviews, analyzes and evaluates information technology systems operations. May require an associate's degree in a related area and 0-3 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a project leader or manager.

### **5. Systems Administrator**

Installs new software releases and system upgrades, evaluates and installs patches and resolves software related problems. Performs system backups and recovery. Maintains data files and monitors system configuration to ensure data integrity. May require a bachelor's degree in a related area with at least two years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a project leader or manager.

### **6. Network Administrator**

Installs, configures and maintains organization's network. Builds networks, maintains external and internal web presence, administers the networks. Performs system backups on its internal and external web network servers. Designs and supports server system(s) and supporting software. May require a bachelor's degree

in a related area and 0-2 years of experience in the field or in a related area. Has knowledge of commonly used concepts, practices and procedures within a particular field. Relies on instructions and pre-established guidelines to perform the functions of the job. Works under immediate supervision and typically reports to a project leader or manager.

**7. Database Administrator**

Administers, maintains, develops and implements policies and procedures for ensuring the security and integrity of the company database. Implements data models and database designs, data access and table maintenance codes, resolves database performance issues, database capacity issues, replication, and other distributed data issues. May require a bachelor's degree in a related area and/or 2-4 years of experience in the field or in a related area. Must be familiar with standard concepts, practices, and procedures within a particular field. Relies on limited experience and judgment to plan and accomplish goals. Performs a variety of tasks. Works under general supervision and typically reports to a manager. A certain degree of creativity and latitude is required.

**II. Employment and Earning Opportunities**

**A. Education and Training Requirements**

Computer maintenance/technical support technician, help desk support, and application/computer support specialist personnel require two years or less of post-secondary education, apprenticeship, specialized training or equivalent work experience. Network administrator, systems administrator, database administrator, and systems operator personnel require at least two years of postsecondary education, apprenticeship, specialized training or equivalent work experience.

**B. Employment Opportunities**

In Illinois, overall employment of information technology workers is expected to grow faster than average through the year 2008. Many information technology occupations are listed on the 50 fastest growing occupations in the state and should provide ample employment opportunities in the future.

**C. Earnings Opportunities**

	<b>Middle Range Annual Earnings, 2000*</b>
Help Desk Support	\$32,392-42,055 <sup>2</sup>
Computer Maintenance/Technical Support Technician	\$33,365-42,763 <sup>2</sup>
System Operator	\$37,997-46,485 <sup>2</sup>
Application/Computer Support Specialist	\$30,763-50,960 <sup>1</sup>
Systems Administrator	\$44,316-53,790 <sup>2</sup>
Network Administrator	\$44,566-61,287 <sup>2</sup>
Database Administrator	\$35,525-74,360 <sup>1</sup>

*\* Middle range is the middle 50%, i.e., one-fourth of persons in the occupation earn below the bottom of the range and one-fourth of persons in the occupation earn above the top of the range.*

Sources: <sup>1</sup> *Occupational Employment Statistics: Wage Data*, Illinois Department of Employment Security, Economic Information and Analysis Division. <sup>2</sup> Salary.com, these numbers are based on the national average adjusted by geographic salary differentials to Bloomington, Illinois as of July 22, 2001.

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### **III. Assessment and Credentialing Systems**

The IOSSCC recognizes that industry commitment for third-party assessment is beneficial and requests that each Standards Development Committee (SDC) and/or Subcouncil identifies the most beneficial method for assessing standards.

Several existing industry credentials are compatible with the Illinois Occupational Skill Standards. As a core, achievement of the Illinois skills standards is preparation for those credentials that require work experience, professional development and/or course work. Advanced credentials are available through a variety of software and/or hardware vendors (e.g., IBM, Microsoft, Cisco, Novell, A+, etc.). The information technology worker should choose the credentialing agency most appropriate to the employer's needs in a particular position.

### **IV. Industry Support and Commitment**

#### **A. Industry Commitment for Development and Updating**

1. The Communications Subcouncil and the Information Technology Operate Cluster Standards Development Committee developed these performance skill standards. The development effort utilized the following steps:
  - a. Identification of performance skills
  - b. Review of resources
  - c. Development of draft performance skills
  - d. Convening of standards development committee
  - e. Validation and approval of performance skills by standards development committee
  - f. Review of skill standards by standards development committee
  - g. Review and approval of the skill standards by the Communications Subcouncil and practitioners
  - h. Endorsement of skill standards by IOSSCC
2. A list of members of the Communications Subcouncil and Information Technology Cluster Standards Development Committee are located in Appendix.

#### **B. Industry Commitment for Marketing**

The Communications Subcouncil is committed to marketing and obtaining support and endorsement from the leading industry associations impacted by the skill standards. Upon recognition/endorsement of the Information Technology Cluster skill standards by the IOSSCC, the subcouncil strongly recommends developing and providing an in-service/seminar package for its members to provide awareness and obtain full industry commitment to the development of a full industry marketing plan.

The Communications Subcouncil encourages the availability of occupational skill standards to the public, including students, parents, workers, educators at all levels, employers and industry organizations.



## **ASSUMPTIONS FOR INFORMATION TECHNOLOGY OPERATE CLUSTER SKILL STANDARDS**

**Skill standards assume that individuals have received education and/or training in a setting such as a secondary, postsecondary and/or apprenticeship/on-the-job training program and have the background knowledge necessary for performing the skill standards contained in this publication. The education and/or training includes instruction for the proper handling and operation of materials, tools and equipment required for performing the skills including the purpose of use, when to use, how to use and any related safety issues.**

**The instructional/training program must adhere to all local, state and federal licensing and/or certification requirements as set by law, if applicable.**

**The Standards Development Committee developed these skill standards based on the following assumptions:**

1. Workplace skills (employability skills) are expected of all individuals. Socialization skills needed for work are related to lifelong career experience and are not solely a part of the initial schooling process. These are not included with this set of statements.
2. The ability to work with numbers and to communicate clearly, concisely and legibly to team members and management are expected of all individuals.
3. Specific policies and procedures of the worksite will be made known to the individual and will be followed.
4. Time elements outlined for the skill standards result from the experience and consideration of the panel of experts who made up the standards development committee.
5. Skills will progress from simple to complex. Once a skill has been successfully performed, it will be incorporated into more complex skills.
6. Skill standards describe the skill only and do not detail the background knowledge or theory related to the particular skill base. Although the skill standard enumerates steps to successful demonstration, rote approaches to the outcomes are not prescribed.
7. Skill standards do not replace, supersede or substitute for procedures manuals.

## PERFORMANCE SKILL LEVELS

	Help Desk Support	Computer Maintenance/ Technical Support Technician	Systems Operator	Application/Computer Support Specialist	Systems Administrator	Network Administrator	Database Administrator
<b>MONITORING</b>							
Develop Customer Service Level Plan	•	•	•	•	•	•	•
Comply with Service Level Agreement	•	•	•	•	•	•	•
Identify Scope of Abnormal System Performance	•	•	•	•	•	•	•
Identify Scope of Security Problems	•	•	•	•	•	•	•
Identify External Environmental Problems	•	•	•	•	•	•	•
Manage Working Relationships with Customers	•	•	•	•	•	•	•
Manage Multiple Customer Requirements	•	•	•	•	•	•	•
Act as Liaison Between Groups		•	•	•	•	•	•
<b>ADMINISTRATION</b>							
Document Problems	•	•	•	•			
Maintain User Accounts on Multiple Systems		•	•	•	•	•	
Format Data		•	•	•	•	•	
Perform Data Analysis	•	•	•	•	•	•	•
Manage Inventory and Assets	•	•		•	•	•	•
Ensure Recoverability of Systems and Services	•	•		•	•	•	•
Maintain System Documentation	•	•	•	•	•	•	•
Review Internal Systems Audit Procedures					•	•	•
Implement Security Procedures	•				•	•	•
<b>CHANGE MANAGEMENT</b>							
Estimate Impact of Change Request		•		•	•	•	
Implement or Revise Processes/Products					•	•	
<b>OPERATIONS</b>							
Install and Configure Software				•			
Perform System Backup Procedures				•			
Initiate and Control Production Applications				•			
Perform Routine Maintenance				•			
Recommend New Features or Enhancements				•			
Write System Software Evaluation Report				•			
Shut Down Systems	•	•	•		•	•	
<b>MAINTENANCE</b>							
Prepare Backup Plan/Procedures	•	•		•	•	•	•
Communicate Changes	•	•		•	•	•	•
Schedule Maintenance with Business Requirements	•	•		•	•	•	•



# PERFORMANCE SKILL LEVELS

(Continued)

	Help Desk Support	Computer Maintenance/ Technical Support Technician	Systems Operator	Application/Computer Support Specialist	Systems Administrator	Network Administrator	Database Administrator
<b>MAINTENANCE (Continued)</b>							
Implement Maintenance/Change Request	•	•		•	•	•	•
Develop/Update Preventative maintenance Plans	•	•		•	•	•	•
Perform Preventative maintenance Plan Diagnostics	•	•		•	•	•	•
<b>TASK MANAGEMENT</b>							
Define Scope of Work to Complete Task		•		•	•	•	•
Coordinate Work Processes and Procedures		•		•	•	•	•
Implement Work Processes and Procedures		•		•	•	•	•
Evaluate Work Processes and Procedures		•		•	•	•	•
<b>TROUBLESHOOTING</b>							
Identify Problem/Incident Cause	•	•	•	•	•	•	•
Implement Solution	•	•	•	•	•	•	•
Evaluate Troubleshooting Processes and Outcomes	•	•	•	•	•	•	•

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Business operational needs (peak times, product cycles, standards and costs, etc.)
- Technical support staff
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Develop customer service level agreement.

**PERFORMANCE CRITERIA**

Written customer service level agreement is prepared for and presented to the customer according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the customer business operational needs.

**PERFORMANCE ELEMENTS**

1. Determine customer goals and expectations.
2. Validate goals and expectations with customer.
3. Review customer goals and expectations with technical support staff.
4. Develop written service level agreement.
5. Present agreement to customer.
6. Revise plan as directed by customer.
7. Obtain customer approval of plan.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Customer service level plan is created.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Customer service level (CSL) agreement
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Monitor compliance with CSL agreement.

**PERFORMANCE CRITERIA**

Acceptable service levels are maintained with the customer according to the CSL agreement.

Time required to complete the skill varies according to CSL requirements.

**PERFORMANCE ELEMENTS**

1. Review CSL agreement standards.
2. Identify current level of service.
3. Compare current level of service to CSL agreement.
4. Meet with customer periodically to assess performance satisfaction.
5. Take appropriate action for service that does not meet CSL agreement.
6. Recommend changes/enhancements to agreement.
7. Document and distribute to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Customer service level expectations are met.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Hardware, software and operating systems
- Interoperability requirements
- Expected system performance
- Company policy and procedures

**WORK TO BE PERFORMED**

Identify scope of abnormal system performance.

**PERFORMANCE CRITERIA**

Abnormal system activity is identified and documented accurately and problem escalation procedures are initiated according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the system and type of abnormal system performance.

(Example: Fifteen-user system on peer to peer network with external POP server with one user unable to receive email; problem scope is identified in 10 minutes.)

**PERFORMANCE ELEMENTS**

1. Evaluate system performance.
2. Identify abnormal system performance.
3. Prioritize severity of problem.
4. Analyze operational problems.
5. Document problem and potential causes.
6. Recommend solutions for corrective action (repair, replace or escalate) to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Solutions for abnormal system activity are recommended.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Documentation and storage tools
- Security tools
- Virus protection software
- Hardware, software and operating systems
- Escalation procedures
- Company policy and procedures

**WORK TO BE PERFORMED**

Identify scope of security problems.

**PERFORMANCE CRITERIA**

Security is maintained according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the system and type of security problems.

(Example: Multiple log on attempts by single user exceeding company parameters is identified by security tools; problem scope is identified in 15 minutes.)

**PERFORMANCE ELEMENTS**

1. Identify potential security problems.
2. Analyze situations.
3. Determine source/type of problem.
4. Identify risks/implications.
5. Recommend solutions for corrective action (repair, replace or escalate) to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

System security is maintained.

**PROCESS**

All performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- System user problem/complaint
- Hardware, software and operating systems
- Interoperability requirements
- Escalation procedures
- Company policy and procedures

**WORK TO BE PERFORMED**

Identify external environmental problems.

**PERFORMANCE CRITERIA**

External environmental problems are identified according to company policy.

Time required to complete the skill varies according to the size and complexity of the system.

(Example: Common external environmental problems [e.g. power cord, loose cables, inoperative components, etc.] on a stand-alone PC are identified within 15 minutes.)

**PERFORMANCE ELEMENTS**

1. Review problem/complaint.
2. Inspect external environmental factors related to complaint (e.g., power cord, loose cables, inoperative components, etc.).
3. Document cause of external environmental problems.
4. Evaluate environmental impact on system.
5. Recommend solutions for corrective action (repair, replace or escalate) to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

External environmental problems are identified and recommendations made.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Customer service level (CSL) agreement
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Manage working relationships with customers.

**PERFORMANCE CRITERIA**

Relationships are managed according to service level agreement.

Time required to complete the skill varies according to the service level agreement.

**PERFORMANCE ELEMENTS**

1. Monitor levels of customer satisfaction.
2. Obtain feedback/concerns from customers.
3. Take appropriate actions to address customer's concerns.
4. Ensure resolution meets customer's expectations.
5. Update customer file with situation/remedies.
6. Document and distribute documentation to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Relationships with customers are managed to mutual satisfaction.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Customer service level (CSL) agreements
- Customer requirements for multiple clients
- Resources (e.g., on-line, manuals, etc.)
- Hardware, software and operating systems
- Department guidelines
- Company policy and procedures

**WORK TO BE PERFORMED**

Manage multiple customer requirements.

**PERFORMANCE CRITERIA**

Multiple customer requirements are maintained according to CSL agreements.  
Time required to complete the skill varies according to CSL agreements.

**PERFORMANCE ELEMENTS**

1. Review CSL for each customer.
2. Prioritize daily tasks.
3. Identify workload requirements and limitations.
4. Set goals.
5. Prepare schedule.
6. Monitor/adjust task sequence.
7. Address customer's concerns to customer's satisfaction.
8. Communicate status to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Resources are deployed to meet the service level agreements of multiple clients.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.



**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Groups responsibilities
- Hardware, software and operating systems
- Business goals
- Company policy and procedures

**WORK TO BE PERFORMED**

Act as liaison between groups.

**PERFORMANCE CRITERIA**

Groups are informed of issues and changes according to company policy and procedures.

Time required to complete the skill varies according to the responsibilities of the groups.

(Example: Two groups [users for customer service vs. maintenance for required service] needing access to same equipment on 24/7 service; time to negotiate adequate resolution is 48 hours.)

**PERFORMANCE ELEMENTS**

1. Analyze group dynamics.
2. Identify underlying issues.
3. Compare multiple viewpoints.
4. Offer contrasting viewpoints.
5. Facilitate cooperation/negotiation.
6. Document resolution.
7. Distribute documentation to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Consensus is established between groups.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

Hardware, software and operating systems  
Customer service level (CSL) Agreement  
Initial problem/complaint  
Documentation process  
Company policy and procedures

**WORK TO BE PERFORMED**

Document problems and communicate to appropriate parties.

**PERFORMANCE CRITERIA**

Problems are documented and communicated according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the problem.

(Example: Fifteen-user system on peer to peer network with external POP server with one user unable to receive email; problem scope is documented in three minutes.)

**PERFORMANCE ELEMENTS**

1. Verify complaint/problem with user.
2. Investigate problem history.
3. Identify possible solutions/escalation route.
4. Create supporting documentation.
5. Communicate information in language appropriate to audience.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Problems are documented and communicated to appropriate parties.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- User account information
- Account management tools (security and storage)
- Network systems
- Hardware, software and operating systems
- Company documentation
- Company policy and procedures

**WORK TO BE PERFORMED**

Maintain user accounts on multiple systems.

**PERFORMANCE CRITERIA**

User accounts are maintained according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the user accounts and systems.

(Examples: A single user is added to the system in five minutes. One user exceeds server space quota; time to resolve is 30 minutes.)

**PERFORMANCE ELEMENTS**

1. Review user account information.
2. Identify required maintenance procedures (e.g., open new account, close old account, troubleshoot account problems, etc).
3. Schedule account maintenance.
4. Complete account maintenance.
5. Document and distribute documentation to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

User accounts are maintained.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Data (incidents)
- Data selection tools
- Data selection methods
- Company policy and procedures

**WORK TO BE PERFORMED**

Format data.

**PERFORMANCE CRITERIA**

Data is formatted according to company policy and procedures.

Time required to complete the skill varies according to the type and quantity of data being processed.

(Example: Incidents tracked through phone logs, problem reporting software, etc. [40,000 incidents per month] are selected, reviewed and formatted in two hours.)

**PERFORMANCE ELEMENTS**

1. Identify required data fields.
2. Select data (incidents).
3. Review for accuracy/completeness.
4. Arrange data into required format
5. Document and distribute to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Data is selected and formatted.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Basic statistical analysis (average, trends, etc.)
- Formatted data
- Analysis tools and methods
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Perform data analysis.

**PERFORMANCE CRITERIA**

Data analysis is performed according to company policy and procedures.

Time required to complete the skill varies according to the quantity of the data and complexity of the system.

(Example: Incidents tracked through phone logs, problem reporting software, etc. [40,000 incidents per month] are selected, reviewed and formatted. The top ten incident resolutions are identified and analyzed for further action in two hours.)

**PERFORMANCE ELEMENTS**

1. Review statistical analysis.
2. Evaluate relevance of data as related to situation.
3. Summarize results and produce insights into system operation.
4. List potential reasons for observed performance.
5. Document areas earmarked for improvement.
6. Distribute documentation to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

System metrics are performed, measured and reported on a regular basis (monthly, weekly, as appropriate).

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- System access
- Inventory databases
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Manage software and hardware inventory and assets.

**PERFORMANCE CRITERIA**

Inventory documentation on system configuration is completed with 100% accuracy.

Time to complete the skill varies according to the hardware/software and configuration.

(Example: New workstation is added to inventory and issued identification number[s] and software licenses are verified in 10 minutes.)

**PERFORMANCE ELEMENTS**

1. Review hardware and software inventory as well as the following:
  - a. Hardware warranties
  - b. Software licenses
  - c. Product releases' currency
2. Assign asset identification numbers to new hardware and software.
3. Monitor configuration and efficient utilization of assets.
4. Coordinate storage and distribution of inventory and assets.
5. Complete supporting documents.
6. Distribute/file documents according to company procedures.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Inventory documentation on system configuration reflects current settings/equipment.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- System components
- Recovery options
- Backup options
- Network architecture
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Ensure recoverability of systems and services.

**PERFORMANCE CRITERIA**

Procedures for recovering systems and services are documented and distributed/filed according to company policy and procedures.

Time to complete the skill varies according to the services required and system size and complexity.

**PERFORMANCE ELEMENTS**

1. Review recovery and backup options.
2. Analyze system configuration for stability.
3. Verify currency of system backup files.
4. Verify backup files are secure.
5. Ensure recovery options are documented accurately.
6. Distribute/file recovery procedures according to company procedures.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Procedures for recovering systems and services are documented.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Current system documentation
- Vendor/product resources/information
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Maintain system documentation.

**PERFORMANCE CRITERIA**

System documentation and updates are maintained according to company policy and procedures.

Time required to complete the skill varies according to the quantity of documentation and complexity of the system.

(Example: System documentation to review and record software revisions, such as annual tax table review for medium to large system, is completed in three hours.)

**PERFORMANCE ELEMENTS**

1. Review current system documentation.
2. Identify new/revised equipment/resources.
3. Update system documentation.
4. Distribute revised documentation according to company procedures.
5. File revised documentation according to company procedures.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

System documentation and updates are maintained.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.



**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- System measurement and monitoring tools
- Auditing procedures
- Hardware, software and operating system
- Company policy and procedures

**WORK TO BE PERFORMED**

Review internal systems audit procedures.

**PERFORMANCE CRITERIA**

Internal systems auditing procedures are current and documented with 100% accuracy.

Time to complete the skill varies according to the complexity of the system.

**PERFORMANCE ELEMENTS**

1. Analyze internal systems audit techniques for accuracy, currency, applicability and usefulness.
2. Recommend revisions to internal systems audit techniques.
3. Document revisions to internal systems audit techniques.
4. Distribute revisions according to company policy and procedures.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Internal systems audit techniques are current and documented.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Security procedures (e.g., system backups, virus protection, end-user and operational security)
- System security processes and audit procedures
- System architecture
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Implement security procedures.

**PERFORMANCE CRITERIA**

Security procedures are implemented and distributed according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of system.

**PERFORMANCE ELEMENTS**

1. Review current security policies.
2. Identify security risks and exposures.
3. Recommend security measures to address risks and exposures.
4. Update security documentation.
5. Implement revised security measures.
6. Distribute documentation to appropriate parties.
7. File documentation.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Security policies are implemented and distributed to appropriate parties.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- System architecture
- Change request (i.e., request for new or upgraded hardware/software)
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Estimate impact of change request.

**PERFORMANCE CRITERIA**

Impact of change request is completed and communicated according to company policy and procedures.

Estimates, costs analysis, tradeoffs and possible alternatives within the system are accurate and complete.

Time required to complete the skill varies according to the complexity of the change request.

**PERFORMANCE ELEMENTS**

1. Analyze current system architecture.
2. Analyze change request.
3. Predict impact of change request on systems.
4. Document recommendation (e.g., estimates, costs analysis, tradeoffs and possible alternatives) on change request.
5. Report recommendations to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Impact of change request is communicated to appropriate parties.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Test methodologies
- Quality assurance principles
- System architecture
- Change request (i.e., request for new or upgraded hardware/software)
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Implement or revise processes/products based on testing and certification.

**PERFORMANCE CRITERIA**

Processes/products are implemented or revised according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the system.

**PERFORMANCE ELEMENTS**

1. Assess accuracy of change request.
2. Analyze current processes/products.
3. Test change request.
4. Identify levels of responsibility for accomplishing change request.
5. Report changes to appropriate individuals.
6. Implement or revise processes/products.
7. Document and distribute changes to appropriate parties.
8. File document according to company procedures.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Processes/products are implemented or revised.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Software installation procedures
- Compatibility issues and resolution procedures
- Network and operating systems
- Vendor procedures
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Install and configure software.

**PERFORMANCE CRITERIA**

Software is installed and configured according to company/vendor policy and procedures.

Time required to complete the skill varies according to the size and complexity of the software and configurations.

**PERFORMANCE ELEMENTS**

1. Evaluate software and system requirements.
2. Compare to existing system requirements.
3. Install and configure new software.
4. Test new software.
5. Troubleshoot and resolve system and software conflicts.
6. Complete documentation.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Software is installed and configured.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

System backup procedures  
Hardware, software and operating systems  
Company policy and procedures

**WORK TO BE PERFORMED**

Perform system backup procedures.

**PERFORMANCE CRITERIA**

System backup procedures are completed according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the system.

**PERFORMANCE ELEMENTS**

1. Review backup procedures.
2. Prepare backup software and hardware.
3. Select system backup(s) to be completed.
4. Run backup.
5. Store backup as required.
6. Document and distribute backup log to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

System backups are collected and documented.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Production applications requirements/parameters
- Operating environment
- Standard and recovery procedures
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Initiate and control production applications.

**PERFORMANCE CRITERIA**

Production application requirements are controlled according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the production applications.

**PERFORMANCE ELEMENTS**

1. Review production applications requirements/parameters.
2. Set parameters for normal operation.
3. Establish reporting mechanisms for abnormal operation.
4. Identify production applications operating outside normal parameters.
5. Identify potential causes for abnormal operation.
6. Take corrective action to restore normal operation.
7. Document abnormal situations and resolutions.
8. Distribute documentation to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Production applications operate properly. Proper recovery from error conditions is consistently maintained.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Diagnostic tools
- Technological results
- Maintenance schedules
- Maintenance manuals
- Documentation
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Perform routine maintenance.

**PERFORMANCE CRITERIA**

Routine maintenance is performed as scheduled according to company policy and procedures.

Time required to complete the skill varies according to the type of maintenance required.

**PERFORMANCE ELEMENTS**

1. Review maintenance schedules.
2. Identify areas requiring routine maintenance.
3. Review maintenance procedures.
4. Follow specified maintenance procedures.
5. Run diagnostic checks on all critical components of system.
6. Troubleshoot failures.
7. Document results.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Routine maintenance is performed.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.



**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- System tools
- Company resources and constraints
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Recommend new features or enhancements to existing tools.

**PERFORMANCE CRITERIA**

New features or enhancements are recommended to improve existing processes.

Time required to complete the skill varies according to the size and complexity of the system.

**PERFORMANCE ELEMENTS**

1. Analyze current system performance.
2. Evaluate impact of system upgrade.
3. Prepare implementation action plan.
4. Justify modification.
5. Document recommendations.
6. Distribute documentation to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Recommendations result in improving existing processes.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Performance data
- Problem logs/records
- Software operations specifications
- System specifications
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Write system software evaluation report.

**PERFORMANCE CRITERIA**

System software evaluation is completed according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the system.

**PERFORMANCE ELEMENTS**

1. Review existing supporting documents (performance data, problem logs, etc.).
2. Analyze information.
3. Update/create supporting documents.
4. Recommend software improvements.
5. Complete system evaluation report.
6. Distribute software evaluation report to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Software evaluation report is completed.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Shutdown procedures
- Vendor procedures
- System architecture
- System configuration
- Company policy and procedures

**WORK TO BE PERFORMED**

Shut down systems.

**PERFORMANCE CRITERIA**

System shutdown is performed according to shutdown procedures.

Time required to complete the skill varies according to the size and complexity of the system.

**PERFORMANCE ELEMENTS**

1. Ensure all users are off the system.
2. Ensure required backups have been performed.
3. Inspect system for potential problems during start-up.
4. Perform shutdown procedures.
5. Document required information.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

System is shut down.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Backup procedures
- Appropriate financial and system integrity risks
- Identified system interdependencies
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Prepare backup plan/procedures.

**PERFORMANCE CRITERIA**

Backup procedures/processes are tested and verified according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the system.

Time to perform steps two through four is approximately 90 minutes.

**PERFORMANCE ELEMENTS**

1. Review existing backup procedures.
2. Evaluate system backup configuration/stability.
3. Identify risks and implications.
4. Examine data and results.
5. Recommend plan of action.
6. Document and distribute documentation to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Backup procedures are audited.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Change management processes
- Organizational structure
- Network architecture
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Communicate changes to appropriate work groups.

**PERFORMANCE CRITERIA**

Changes are communicated according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the changes.

**PERFORMANCE ELEMENTS**

1. Review recommended changes.
2. Review system capabilities.
3. Organize change requirements and impacts.
4. Document and distribute documentation to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Change request documentation is completed and distributed to appropriate parties.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Maintenance tools
- Change/maintenance request
- Customer service level agreement (CSL)
- Business requirements
- Network and operating system environments
- Company policy and procedures

**WORK TO BE PERFORMED**

Schedule requested maintenance to provide minimum interruption of business requirements.

**PERFORMANCE CRITERIA**

Requested maintenance is scheduled according to company policy and procedures.

Time required to complete the skill is one hour.

**PERFORMANCE ELEMENTS**

1. Review business requirements.
2. Review change/maintenance request.
3. Review customer service level agreement.
4. Identify required personnel versus availability.
5. Schedule timeline for completing request.
6. Document maintenance schedule.
7. Distribute documentation to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Maintenance schedule is communicated to appropriate parties.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Upgrade and installation procedures
- Data conversion issues and procedures
- Maintenance/change request
- Maintenance schedule
- Compatibility issues and resolution procedures
- Network architecture
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Implement maintenance/change request.

**PERFORMANCE CRITERIA**

Maintenance/change request is completed according to maintenance schedule and company policy and procedures.

Time required to complete the skill varies according to the scope and complexity of the system and change request.

**PERFORMANCE ELEMENTS**

1. Review maintenance/change request and schedule.
2. Evaluate system configuration/stability.
3. Implement technological improvements/changes.
4. Reevaluate system configuration/stability.
5. Document completion of change.
6. Distribute and store documentation.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Maintenance/change request is implemented.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Vendor recommended maintenance
- Service level/maintenance agreement
- System requirements
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Develop/update preventative maintenance plans.

**PERFORMANCE CRITERIA**

Preventative maintenance plans are developed/updated according to company policy and procedures.

Time required to complete the skill varies according to the complexity of the system. Preventative maintenance plans are developed/updated according to company policy and procedures.

**PERFORMANCE ELEMENTS**

1. Review vendor recommendations.
2. Review service level agreements.
3. Review and document level of system activity.
4. Review current maintenance plan.
5. Recommend additional needs for preventative maintenance plan.
6. Test revised plan.
7. Document and distribute plan to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Preventative maintenance plan is developed/updated and communicated to appropriate parties.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.



**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Diagnostic procedures and processes
- Diagnostic tools
- Diagnostic schedule
- Preventative maintenance plan
- Expected results
- Monitoring feedback
- Online resources
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Perform preventative maintenance plan diagnostics.

**PERFORMANCE CRITERIA**

Preventative maintenance plan diagnostics is executed according to company policy and procedures and diagnostic schedule.

Time required to complete the skill varies according to the scope and complexity of the diagnoses being performed.

**PERFORMANCE ELEMENTS**

1. Review maintenance plan/diagnostic schedule.
2. Run diagnostic tools.
3. Compare outcome to expected results.
4. Document recommended diagnostic changes.
5. Distribute recommendations to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Preventative maintenance plan diagnostics are completed.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Task timeline
- Task and related task objectives
- Time management strategy
- Applicable standards, regulations and laws
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Define scope of work to complete task.

**PERFORMANCE CRITERIA**

Specifics of the task are identified and communicated.

Time required to complete the skill varies according to the size and complexity of the task.

**PERFORMANCE ELEMENTS**

1. Review task, objectives and timeline.
2. Formulate an activity plan (step sequence).
3. Predict outcomes/results based on experience or prior knowledge.
4. Develop time plan for task.
5. Assign personnel responsibilities for activity plan.
6. Document recommendations and distribute to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Specifics of the task are identified and coordinated with the team.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Time and activity plan
- Forecast tools and resources
- Material request procedures
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Coordinate work processes and procedures.

**PERFORMANCE CRITERIA**

Work processes or procedures are coordinated according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the task.

**PERFORMANCE ELEMENTS**

1. Review time and activity plan.
2. Obtain required tools and resources.
3. Communicate work assignments to appropriate parties.
4. Distribute tools and resources to appropriate parties..
5. Document steps and projected completion times.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Work processes and procedures are coordinated.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Work processes and procedures
- Time and activity plan
- Forecast tools and resources
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Implement work processes and procedures.

**PERFORMANCE CRITERIA**

Implementation is completed according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the task.

**PERFORMANCE ELEMENTS**

1. Review time and activity plan and work processes and procedures.
2. Ensure all team members are ready and have the required tools and resources.
3. Monitor task completion.
4. Resolve issues.
5. Document task completion.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Work processes and procedures are implemented.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Standard evaluation systems
- Work processes and procedures
- Time and activity plan
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Evaluate work processes and procedures.

**PERFORMANCE CRITERIA**

Work processes and procedures are evaluated according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the work processes and procedures.

**PERFORMANCE ELEMENTS**

1. Review time and activity plans, and work processes and procedures.
2. Evaluate quality of work performed.
3. Evaluate time spent on task.
4. Suggest improvements to the process.
5. Recommend changes to training, documentation, preparation, policy, etc.
6. Complete task status report.
7. Distribute and store report.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Task status report is completed.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Problem definition
- Incident logs
- Diagnostic tools and procedures
- History of known problems
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Identify cause of system problem/incidents.

**PERFORMANCE CRITERIA**

Cause of system problems/incidents are identified according to company policy and procedures.

Time varies according to the system problem/incident and the diagnostic tests required.

**PERFORMANCE ELEMENTS**

1. Review problem/incident information.
2. Review incident logs for similar occurrences.
3. Assess problem/incident with diagnostic tools and procedures.
4. Determine scope of problem.
5. Document cause of problem/incident and plan of action.
6. Communicate results to appropriate individuals.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Cause of problem/incident is identified and documented.

**PROCESS**

All performance elements for identifying cause of problem/incident are critical.

**SKILL STANDARD****CONDITIONS OF PERFORMANCE**

Given the following:

- Problem definition
- Problem cause documentation
- Incident logs
- Diagnostic tools and procedures
- History of known problems
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Implement problem resolution.

**PERFORMANCE CRITERIA**

Problem resolution is implemented according to company policy and procedures.

Time required to complete the skill varies according to the size and complexity of the problem and system.

**PERFORMANCE ELEMENTS**

1. Review problem/incident cause documentation.
2. Review incident logs against current problem.
3. Identify potential solutions.
4. Test and evaluate potential solutions.
5. Identify most effective resolution.
6. Implement resolution.
7. Document and communicate results to appropriate parties.

**PERFORMANCE ASSESSMENT CRITERIA****PRODUCT**

Resolution is implemented and problem/incident corrected.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.

**SKILL STANDARD**

**CONDITIONS OF PERFORMANCE**

Given the following:

- Problem definition
- Problem cause documentation
- Problem cause resolution
- Previous troubleshooting evaluations
- Standard evaluation systems
- Hardware, software and operating systems
- Company policy and procedures

**WORK TO BE PERFORMED**

Evaluate troubleshooting processes and outcomes.

**PERFORMANCE CRITERIA**

Evaluation of the troubleshooting processes is completed according to company policy and procedures.

Time required to complete the skill varies according to the feedback required.

**PERFORMANCE ELEMENTS**

1. Review problem definition, problem cause documentation and resolution.
2. Review processes followed.
3. Compare to previous troubleshooting evaluations.
4. List possible improvements to the process.
5. Recommend changes to training, documentation, policy, etc.
6. Complete evaluation report.
7. Distribute and store report.

**PERFORMANCE ASSESSMENT CRITERIA**

**PRODUCT**

Evaluation of troubleshooting processes is completed.

**PROCESS**

The performance elements are numbered to show an appropriate sequence for completing the skill.



<b>Network and Online Resources</b>	Resources for product development that include, but are not limited to, the intranet, internet, LAN, etc.
<b>Physical Requirements</b>	The space allocation requirements that are necessary to host/house proposed new equipment.
<b>System Requirements</b>	The technical specifications required by the proposed hardware and/or software to properly communicate with the existing system.
<b>System Development Life Cycle (SDLC)</b>	The methodology used for project planning, development, implementation and support of system projects. The methodology phases include: define requirements, design, build, test and implement.
<b>Human Factors</b>	Identification of symbols, use of colors, language, etc. that is widely recognizable and not offensive or insulting to end users.
<b>Usability Factors</b>	The features, requirements, etc. as specified by the client and/or team members for the implementation and/or use of new hardware/software.
<b>Team Members</b>	Includes all parties involved in the project (e.g., client, staff, other divisions, etc.)
<b>Multimedia</b>	Computer-based technologies such as full motion video, animation and high-quality images that are used to create, integrate and present electronic information beyond the conventional text and graphic formats.

<b>Academic Skills</b>	Skills (and related knowledge) contained in the subject areas and disciplines addressed in most national and state educational standards, including English, mathematics, science, etc.
<b>Assessment</b>	A process of measuring performance against a set of standards through examinations, practical tests, performance observations and/or the completion of work portfolios.
<b>Content Standard</b>	A specification of what someone should know or be able to do to successfully perform a work activity or demonstrate a skill.
<b>Critical Work Functions</b>	<p>Distinct and economically meaningful sets of work activities critical to a work process or business unit which are performed to achieve a given work objective with work outputs that have definable performance criteria. A critical work function has three major components:</p> <ul style="list-style-type: none"> <li>• <b>Conditions of Performance:</b> The information, tools, equipment and other resources provided to a person for a work performance.</li> <li>• <b>Work to Be Performed:</b> A description of the work to be performed.</li> <li>• <b>Performance Criteria:</b> The criteria used to determine the required level of performance. These criteria could include product characteristics (e.g., accuracy levels, appearance, etc.), process or procedure requirements (e.g., safety, standard professional procedures, etc.) and time and resource requirements. The IOSSCC requires that these performance criteria be further specified by more detailed individual performance elements and assessment criteria.</li> </ul>
<b>Credentialing</b>	The provision of a certificate or award to an individual indicating the attainment of a designated set of knowledge and skills and/or the demonstration of a set of critical work functions for an industry/occupational area.
<b>Illinois Occupational Skill Standards and Credentialing Council (IOSSCC)</b>	Legislated body representing business and industry which establishes skill standards criteria, endorses final products approved by the industry subcouncil and standards development committee and assists in marketing and dissemination of occupational skill standards.
<b>Industry</b>	Type of economic activity, or product or service produced or provided in a physical location (employer establishment). They are usually defined in terms of the Standard Industrial Classification (SIC) system.

<b>Industry Subcouncil</b>	Representatives from business/industry and education responsible for identifying and prioritizing occupations for which occupational performance skill standards are adapted, adopted or developed. They establish standards development committees and submit developed skill standards to the IOSSCC for endorsement. They design marketing plans and promote endorsed skill standards across the industry.
<b>Knowledge</b>	Understanding the facts, principles, processes, methods and techniques related to a particular subject area, occupation or industry.
<b>Occupation</b>	A group or cluster of jobs, sharing a common set of work functions and tasks, work products/services and/or worker characteristics. Occupations are generally defined in terms of a national classification system including the Standard Occupational Classification (SOC), Occupational Employment Statistics (OES) and the Dictionary of Occupational Titles (DOT).
<b>Occupational Cluster</b>	Grouping of occupations from one or more industries that share common skill requirements.
<b>Occupational Skill Standards</b>	Specifications of content and performance standards for critical work functions or activities and the underlying academic, workplace and occupational knowledge and skills needed for an occupation or an industry/occupational area.
<b>Occupational Skills</b>	Technical skills (and related knowledge) required to perform the work functions and activities within an occupation.
<b>Performance Standard</b>	A specification of the criteria used to judge the successful performance of a work activity or the demonstration of a skill.
<b>Product Developer</b>	Individual contracted to work with the standard development committee, state liaison, industry subcouncil and IOSSCC for the adaptation, adoption or development of skill standards content.
<b>Reliability</b>	The degree of precision or error in an assessment system so repeated measurements yield consistent results.

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<b>Skill</b>	A combination of perceptual, motor, manual, intellectual and social abilities used to perform a work activity.
<b>Skill Standard</b>	Statement that specifies the knowledge and competencies required to perform successfully in the workplace.
<b>Standards Development Committee</b>	Incumbent workers, supervisors and human resource persons within the industry who perform the skills for which standards are being developed. Secondary and postsecondary educators are also represented on the committee. They identify and verify occupational skill standards and assessment mechanisms and recommend products to the industry subcouncil for approval.
<b>State Liaison</b>	Individual responsible for communicating information among all parties (e.g., IOSSCC, subcouncil, standard development committee, product developer, project director, etc.) in skill standard development.
<b>Third-Party Assessment</b>	An assessment system in which an industry-designated organization (other than the training provider) administers and controls the assessment process to ensure objectivity and consistency. The training provider could be directly involved in the assessment process under the direction and control of a third-party organization.
<b>Validity</b>	The degree of correspondence between performance in the assessment system and job performance.
<b>Workplace Skills</b>	The generic skills essential to seeking, obtaining, keeping and advancing in any job. These skills are related to the performance of critical work functions across a wide variety of industries and occupations including problem solving, leadership, teamwork, etc.

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**APPENDIX C**

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<b>Margaret Blackshere</b>	AFL-CIO
<b>Skip Douglas</b>	Lucent Technologies
<b>Judith Hale</b>	Hale Associates
<b>Terry Hoyland</b>	Caterpillar University Caterpillar, Inc.
<b>Michael O'Neill</b>	Chicago Building Trades Council
<b>Janet Payne</b>	United Samaritans Medical Center
<b>Gene Rupnik</b>	Hospitality Industry
<b>Jim Schultz</b>	Illinois Retail Merchants Association Walgreen Company

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<b>Larry Benda</b>	Training Manager Madden Communications
<b>Doug Dougherty</b>	President Illinois Telephone Association
<b>Mike Gilley</b>	Business Development Manager Hewlett Packard
<b>Ron Hawks</b>	Education Director Graphics Communication International Union (GCIU)
<b>John Highhouse</b>	Program Director Lincoln Trail College, South Campus
<b>Grey Holcomb</b>	Director of Human Resources Karmak, Inc.
<b>Jeff King</b>	Education Representative Microsoft, Inc..
<b>Lyle Dennis</b>	President/CEO Illinois Broadcasters Association
<b>John Maxson</b>	Executive vice-President Speedcolor, Inc.
<b>Larry Miller</b>	Director of Switch Engineering Illinois Consolidated Communications
<b>Daniel A. Reed</b>	Head of Department of Computer Science University of Illinois at Urbana-Champaign
<b>Candace Renwall</b>	Executive Director Chicago Software Association
<b>Dennis Slenko</b>	Executive Director AEA
<b>Greg Sutton</b>	President Terasys
<b>Ron Engstrom</b>	State Liaison Illinois State Board of Education

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**APPENDIX E****INFORMATION TECHNOLOGY OPERATE CLUSTER  
STANDARDS DEVELOPMENT COMMITTEE**

<b>Nita Adams</b>	Springfield, Illinois
<b>Deborah Barrett</b>	Darien, Illinois
<b>Pam Brewer</b>	Danville VOTEC
<b>Steve Buche</b>	John Deer Special Technology Group
<b>Jenni Dahl</b>	Springfield Public Schools
<b>Adam Floro</b>	Southern Illinois University-Carbondale
<b>Dennis Gallo</b>	O'Fallon Elementary School District
<b>Anu Gokhale</b>	Illinois State University
<b>Larry Jeralds</b>	Southern Illinois University-Carbondale
<b>Sam Kamin</b>	University of Illinois Urbana
<b>Trent Pearson</b>	Knoxville, IL
<b>Jerry Richards</b>	Southern Illinois University-Carbondale
<b>Robert Shaw</b>	Heartland Community College
<b>Roland Spaniol</b>	Charleston, IL
<b>Johnny tenBroek</b>	Heartland Community College
<b>Randy von Liski</b>	Illinois Technology Office
<b>Jim Wright</b>	State Farm – Bloomington, IL
<b>Earl Gott</b>	Product Developer Spoon River College
<b>Ron Engstrom</b>	State Liaison Illinois State Board of Education

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- A. Developing an Employment Plan**
1. Match interests to employment area.
  2. Match aptitudes to employment area.
  3. Identify short-term work goals.
  4. Match attitudes to job area.
  5. Match personality type to job area.
  6. Match physical capabilities to job area.
  7. Identify career information from counseling sources.
  8. Demonstrate a drug-free status.
- 
- B. Seeking and Applying for Employment Opportunities**
1. Locate employment opportunities.
  2. Identify job requirements.
  3. Locate resources for finding employment.
  4. Prepare a resume.
  5. Prepare for job interview.
  6. Identify conditions for employment.
  7. Evaluate job opportunities.
  8. Identify steps in applying for a job.
  9. Write job application letter.
  10. Write interview follow-up letter.
  11. Complete job application form.
  12. Identify attire for job interview.
- 
- C. Accepting Employment**
1. Apply for social security number.
  2. Complete state and federal tax forms.
  3. Accept or reject employment offer.
  4. Complete employee's Withholding Allowance Certificate Form W-4.
- 
- D. Communicating on the Job**
1. Communicate orally with others.
  2. Use telephone etiquette.
  3. Interpret the use of body language.
  4. Prepare written communication.
  5. Follow written directions.
  6. Ask questions about tasks.
- 
- E. Interpreting the Economics of Work**
1. Identify the role of business in the economic system.
  2. Describe responsibilities of employee.
  3. Describe responsibilities of employer or management.
  4. Investigate opportunities and options for business ownership.
  5. Assess entrepreneurship skills.
- 
- F. Maintaining Professionalism**
1. Participate in employment orientation.
  2. Assess business image, products and/or services.
  3. Identify positive behavior.
  4. Identify company dress and appearance standards.
  5. Participate in meetings in a positive and constructive manner.
  6. Identify work-related terminology.
  7. Identify how to treat people with respect.



<b>G. Adapting to and Coping with Change</b>	<ol style="list-style-type: none"> <li>1. Identify elements of job transition.</li> <li>2. Formulate a transition plan.</li> <li>3. Identify implementation procedures for a transition plan.</li> <li>4. Evaluate the transition plan.</li> <li>5. Exhibit ability to handle stress.</li> <li>6. Recognize need to change or quit a job.</li> <li>7. Write a letter of resignation.</li> </ol>
<b>H. Solving Problems and Critical Thinking</b>	<ol style="list-style-type: none"> <li>1. Identify the problem.</li> <li>2. Clarify purposes and goals.</li> <li>3. Identify solutions to a problem and their impact.</li> <li>4. Employ reasoning skills.</li> <li>5. Evaluate options.</li> <li>6. Set priorities.</li> <li>7. Select and implement a solution to a problem.</li> <li>8. Evaluate results of implemented option.</li> <li>9. Organize workloads.</li> <li>10. Assess employer and employee responsibility in solving a problem.</li> </ol>
<b>I. Maintaining a Safe and Healthy Work Environment</b>	<ol style="list-style-type: none"> <li>1. Identify safety and health rules/procedures.</li> <li>2. Demonstrate the knowledge of equipment in the workplace.</li> <li>3. Identify conservation and environmental practices and policies.</li> <li>4. Act during emergencies.</li> <li>5. Maintain work area.</li> <li>6. Identify hazardous substances in the workplace.</li> </ol>
<b>J. Demonstrating Work Ethics and Behavior</b>	<ol style="list-style-type: none"> <li>1. Identify established rules, regulations and policies.</li> <li>2. Practice cost effectiveness.</li> <li>3. Practice time management.</li> <li>4. Assume responsibility for decisions and actions.</li> <li>5. Exhibit pride.</li> <li>6. Display initiative.</li> <li>7. Display assertiveness.</li> <li>8. Demonstrate a willingness to learn.</li> <li>9. Identify the value of maintaining regular attendance.</li> <li>10. Apply ethical reasoning.</li> </ol>
<b>K. Demonstrating Technological Literacy</b>	<ol style="list-style-type: none"> <li>1. Demonstrate basic keyboarding skills.</li> <li>2. Demonstrate basic knowledge of computing.</li> <li>3. Recognize impact of technological changes on tasks and people.</li> </ol>
<b>L. Maintaining Interpersonal Relationships</b>	<ol style="list-style-type: none"> <li>1. Value individual diversity.</li> <li>2. Respond to praise or criticism.</li> <li>3. Provide constructive praise or criticism.</li> <li>4. Channel and control emotional reactions.</li> <li>5. Resolve conflicts.</li> <li>6. Display a positive attitude.</li> <li>7. Identify and react to sexual intimidation/harassment.</li> </ol>
<b>M. Demonstrating Teamwork</b>	<ol style="list-style-type: none"> <li>1. Identify style of leadership used in teamwork.</li> <li>2. Match team member skills and group activity.</li> <li>3. Work with team members.</li> <li>4. Complete a team task.</li> <li>5. Evaluate outcomes.</li> </ol>



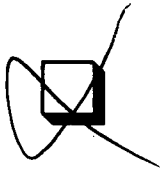


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