

MINNESOTA PIPELINE PROJECT

PRIVATE INVESTMENT, PUBLIC EDUCATION LABOR AND INDUSTRY EXPERIENCE

INFORMATION TECHNOLOGY OCCUPATIONS

Security Analyst - A security analyst is responsible for maintaining the security and integrity of data. They must have knowledge of every aspect of information security within the company. Their main job is to analyze the security measures of a company and determine how effective they are.

Industry-Sector Technical Competencies

- Communication, Systems, Network Security – Training in keeping communications, systems and networks secure.
- Forensics and Investigations – Knowledge of IT forensics to recover information and investigate network security breaches.
- Asset Security – Understanding of procedures to inventory IT assets and securely manage IT resources.
- Identity, Access Management – Training in granting users appropriate access to IT resources and preventing access by non-authorized users.
- Disaster Recovery, Business Continuity – Understand the importance of keeping business functions and computing processes on-going and how to recover from an outage or equipment failure. Strategic contingency planning for catastrophic system failure.
- Security Engineering and Operations – Training in managing security environments and able to resolve technical issues.
- Security Assessment and Testing – Understanding of how to secure internal and external applications/systems and applying techniques to test asset security.
- Application Security – Knowledge of measures taken to prevent gaps (vulnerabilities) in the security policy of an application or the underlying system through flaws in the design, development, deployment, upgrade, or maintenance of the application.
- Data Security – Training in protecting data from destructive and unwanted actions of unauthorized and/or careless users.

Occupation-Specific Competencies

- Firewall – Able to maintain and update the security system controlling the incoming and outgoing network traffic.
- Linux/ UNIX – Demonstrate knowledge of Linux/UNIX operating systems and the underlying source codes.
- Cyber Security – Demonstrate knowledge of processes and mechanisms by which digital equipment, information and services are protected from unintended or unauthorized access.
- Security Information and Event Management (SIEM) – Ability to use the principles of real-time monitoring, correlation of events, notifications and console views (security event management -SEM) as well as providing long-term storage as well as analysis and reporting of log data (security information management-SIM).
- Intrusion Prevention System (IPS) – Maintain network security appliances that monitor network and/or system activities for malicious activity.
- Network Security – Ability to monitor authorized access, prevent misuse and unauthorized modification, or denial to computer network and network-accessible resources.
- Penetration Testing – Use appropriate methods to attack a computer system to look for security weaknesses, potentially gaining access to the computer's features and data.
- Network Access Control (NAC) – Implement and monitor protocols to secure access to network through tools such as antivirus, host intrusion prevention, and vulnerability assessment, user or system authentication and network security enforcement.
- Intrusion Detection – Demonstrate ability to monitor network or system activities for malicious activities or policy violations.
- Risk Assessment – *Ability* to identify vulnerabilities and threats to the information resources used and deciding what countermeasures, if any, to take to reduce risk.
- Application Security – Ability to identify and/or implement sound coding and testing practices for enterprise applications and software systems.
- Transmission Control Protocol (TCP/IP) – Understand and use protocol to provide reliable, ordered, and error-checked delivery of information between applications running on hosts communicating over an IP network.
- Disaster Recovery – Show competency in rapid restoration of data, systems, and services in the event of significant incidents and disasters using well-designed backups, system redundancies and role management.
- Security Engineering and Administration – Demonstrate ability to implement secure computing environments, controls and countermeasures.

Top Requested Industry Credentials

Certified Information Systems Security Professional (CISSP)

Certified Information Systems Auditor (CISA)

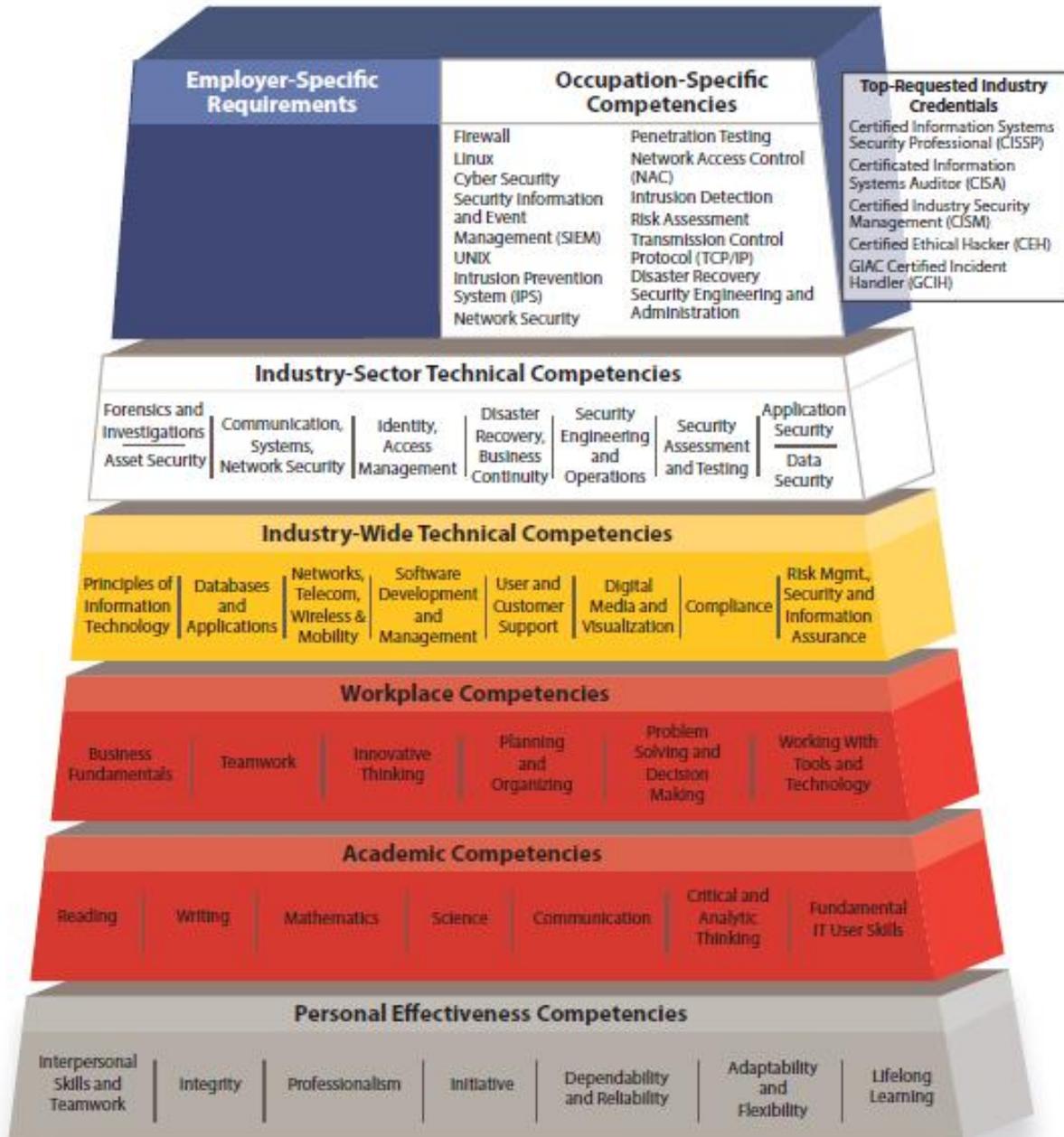
Certified Industry Security Management (CISM)

Certified Ethical Hacker (CEH)

GIAC Certified Incident Handler (GCIH)

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Competency Model for Information Technology Occupation: Security Analyst



Based on: Information Technology Competency Model Employment and Training Administration, United States Department of Labor, September 2012.

Security Analyst Occupational Competency Training Plan

Related Instruction means an organized and systematic form of instruction designed to provide the apprentice with the knowledge of the theoretical and technical subjects related to the apprentice's trade of occupation, or industrial courses or, when of equivalent value, by correspondence, electronic media, or other forms or self-study approved by the commissioner.

	Course	Course Description	Credit/Non-Credit	Hours Spent on Competency
Communication, Systems, Network Security				
Forensics and Investigations				
Asset Security				
Identity, Access Management				
Disaster Recovery, Business Continuity				
Security Engineering and Operations				
Security Assessment and Testing				
Application Security				

Data Security				
<i>On-The-Job Training is the work experience and instruction. Training experience need not be in the exact order as listed below.</i>				
	Trainer/Instructor	Name of person responsible for verifying competency mastery	Hours Spent on Competency	
Firewall				
Linux/UNIX				
Cyber Security				
Security Information and Event Management (SIEM)				
Intrusion Prevention System (IPS)				
Network Security				
Penetration Testing				
Network Access Control (NAC)				

Intrusion Detection			
Risk Assessment			
Application Security			
Transmission Control Protocol (TCP/IP)			
Disaster Recovery			
Security Engineering and Administration			

MINNESOTA PIPELINE PROJECT

PRIVATE INVESTMENT, PUBLIC EDUCATION LABOR AND INDUSTRY EXPERIENCE

Service Desk/Front Line Supports or Computer User Support Specialist –

A computer user support specialist provides technical assistance to computer users. Answer questions or resolve computer problems for clients in person, telephone or electronically. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems. Should have a mix of technical and customer service skills, and be passionate about technology and helping people.

Industry-Sector Technical Competencies

- Trouble Ticket Systems, Connecting Remotely – Knowledge how to use trouble ticket tracking systems and how to connect remotely to users computers.
- Communication with Customer and their Trouble Tickets– Understanding of providing proper communication with the customer and addressing the trouble tickets in a timely fashion.
- Install, Configure, Repair Workstations – Understanding of procedures to install, configure and repair individual workstations.
- Common Network Devices, Routers and Switches – Familiarity of common network devices, routers and switches and how to resolve technical issues with these components.
- System Backups, Retrieve and Restore Lost Files and Data – Knowledge of the importance of system backups and how to run them. Understanding of how to retrieve and restore lost files and data.

Occupation-Specific Competencies

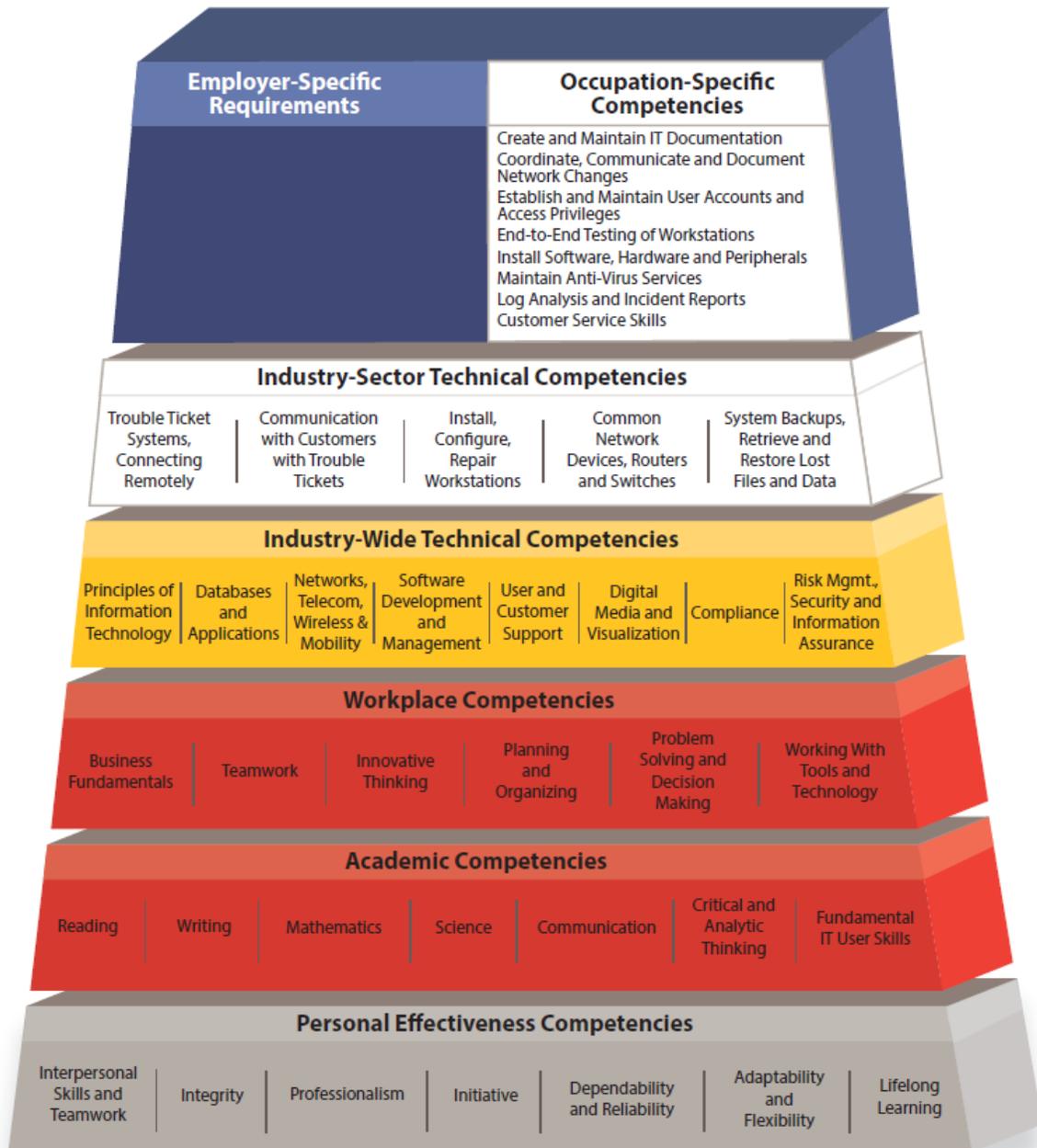
- Create and Maintain IT Documentation – Able to create and maintain documentation regarding customer issues, standard procedures and work processes.
- Coordinate, Communicate and Document Network Changes – Assist in coordinating, communicating and documenting network changes.
- Establish and Maintain User Accounts and Access Privileges– Demonstrate ability to enable and maintain/update user accounts and grant appropriate privileges.
- End-to-End Testing of Workstations – Ability to perform end-to-end testing to ensure that the components of an application function as expected. The entire application is tested in a real-world scenario such as communicating with the database, network, hardware and other applications.

- Install Software, Hardware and Peripherals – Install software, hardware and peripherals to specifications and confirm proper operation.
- Maintain Anti-Virus Services – Update anti-virus and firewall systems as required.
- Log Analysis and Incident Reports – Use proper documentation procedures to track system/station analysis and incident reports.
- Customer Service Skills – Practice good customer service skills by using professional communication techniques and technical expertise.

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Competency Model for Information Technology

Occupation: Service Desk/Front Line Support or Computer User Support Specialist



Based on: Information Technology Competency Model Employment and Training Administration, United States Department of Labor, September 2012.

Service Desk/Front Line Support or Computer User Support Specialist Occupational Competency Training Plan

***Related Instruction** means an organized and systematic form of instruction designed to provide the apprentice with the knowledge of the theoretical and technical subjects related to the apprentice's trade of occupation, or industrial courses or, when of equivalent value, by correspondence, electronic media, or other forms or self-study approved by the commissioner.*

	Course	Course Description	Credit/Non-Credit	Hours Spent on Competency
	Trouble Ticket Systems/Connecting Remotely			
	Communication with Customers with Trouble Tickets			
	Install, Configure, Repair Workstations			
	Common Network Devices, Routers and Switches			
	System Backups, Retrieve and Restore Lost Files and Data			

***On-The-Job Training** is the work experience and instruction. Training experience need not be in the exact order as listed below.*

	Trainer/Instructor	Name of person responsible for verifying competency mastery	Hours Spent on Competency
	Create and Maintain IT Documentation		
	Coordinate, Communicate and Document Network Changes		

Establish and Maintain User Accounts and Access Privileges			
End-to-End Testing of Workstations			
Install Software, Hardware and Peripherals			
Maintain Anti-Virus Services			
Log Analysis and Incident Reports			
Customer Service Skills			

MINNESOTA PIPELINE PROJECT

PRIVATE INVESTMENT, PUBLIC EDUCATION LABOR AND INDUSTRY EXPERIENCE

Software Developer - Software developers design, build and test computer systems that help organizations and equipment to work more effectively. Examples of work include information databases, programs that control robotic systems, and cloud and mobile applications.

Industry-Sector Technical Competencies

- Bash Shell Scripting – Knowledge of scripting a UNIX shell or command language.
- Software Testing – Knowledge of how to evaluate software to make sure it meets specified requirements. Also to identify any gaps, errors or missing requirements.
- Software Analysis and Design – Understanding of modeling and its central role in eliciting, understanding, analyzing and communicating software requirements, architecture and design.
- Programming – Training to create programs by writing "code" in a programming language.
- Service Oriented Architectures – Understand the architectural pattern in computer software design in which application components provide services to other components via a communications protocol, typically over a network.
- Logic – Training in the part of the program that encodes the real-world business rules that determine how data can be created, displayed, stored, and changed.
- Object Orientated Programming – Understanding this type of programming in which programmers define not only the data type of a data structure, but also the types of operations (functions) that can be applied to the data structure.
- Databases – Knowledge of implementing data models and database designs to ensure security and data integrity in database software.
- Version Control – Understanding of the system that records changes to a file or set of files over time so that you can recall specific versions later.
- Data Structures & Algorithms – Knowledge of the use of data structures and algorithms in software programming.
- Operating Systems – Understand the function of operating systems and how to properly create software to interact with them.
- Unified Modeling Language – Understanding of the general-purpose modeling language for software engineering, designed to provide a standard way to visualize the design of a system.

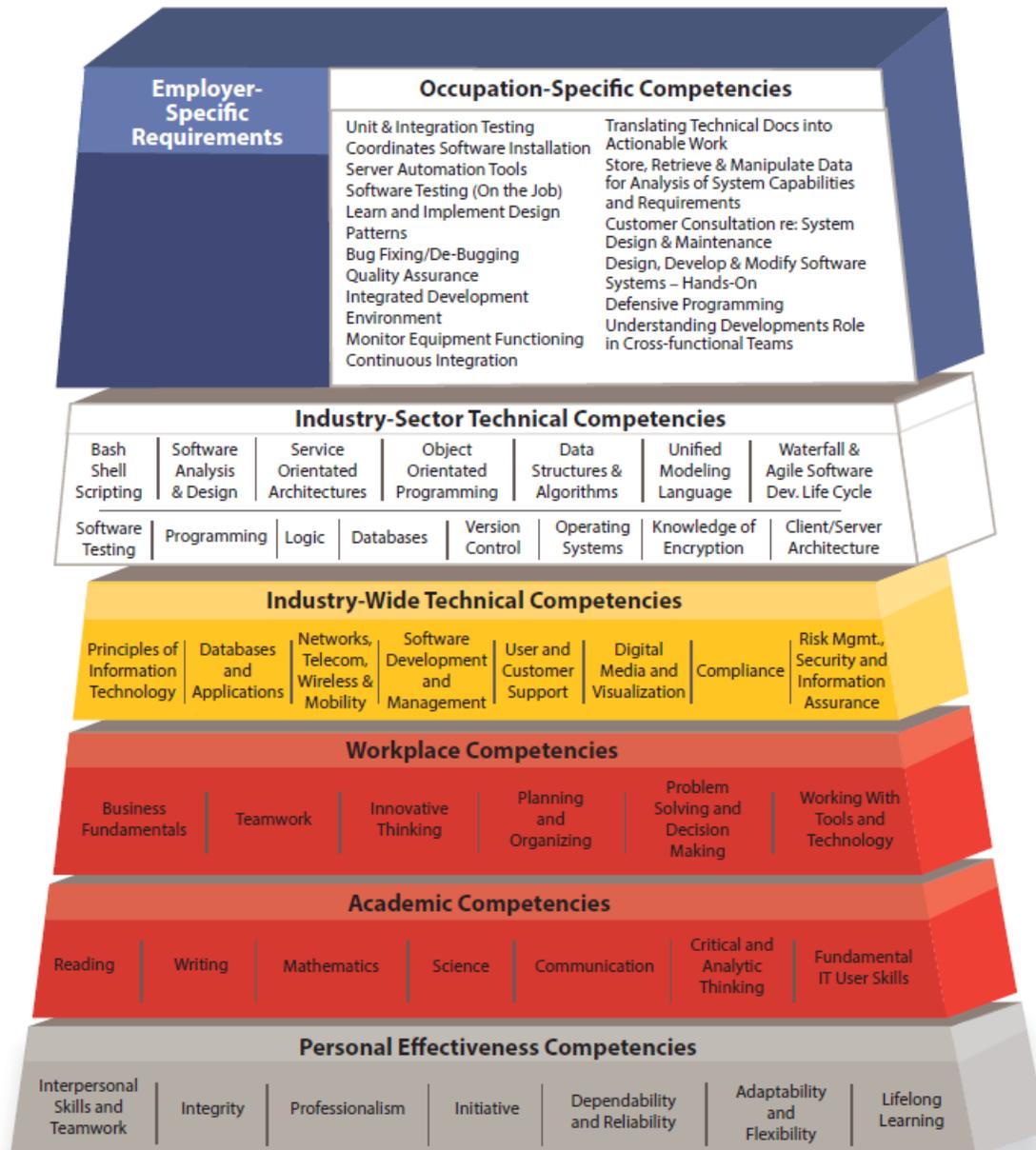
- Knowledge of Encryption – Understanding of how encryption functions and how to work with it within the software development environment.
- Software Development Life Cycle – Knowledge of Waterfall and Agile approaches to software development and when to use the appropriate model.
- Client/Server Architecture – Knowledge of the Client/Server Architecture model and how to develop software for such a system.

Occupation-Specific Competencies

- Unit & Integration Testing – Able to test various computing scenarios for units and integration.
- Coordinate Software Installation – Assist with software installation for the organization and individual user.
- Server Automation Tools – Know how to use applications which automate computing functions.
- Software Testing (On The Job) – Ability to run tests on software and test for compatibility and functionality issues.
- Learn and Implement Design Patterns – Use design patterns for problem solving in programming.
- Bug Fixing/De-Bugging – Ability to locate, fix or bypass errors (bugs) in code or devices.
- Quality Assurance – Use appropriate methods to verify overall quality of software design and system work.
- Integrated Development Environment – Use the IDE application for software development.
- Monitor Equipment Functioning – Monitor system in order to review information to detect or assess problems.
- Continuous Integration – Merge developer working copies with shared mainline several times a day.
- Translating Technical Docs Into Actionable Work – Understand how to create working process documents from very technical IT documents.
- Data Analysis – Store, retrieve and manipulate data for analysis of system capabilities and requirements.
- Customer Consultation - Work with internal and external customers to gather information regarding software requirements and customization.
- Software Systems – Demonstrate ability to design, develop and modify software systems.
- Defensive Programming – Ability to design model intended to ensure the continuing function of a piece of software under unforeseen circumstances.
- Cross-Functional Teams – Understand the software development role while working with cross-functional teams.

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Competency Model for Information Technology Occupation: Software Developer



Based on: Information Technology Competency Model Employment and Training Administration, United State Department of Labor, September 2012 and Digital Industries Trailblazer Apprenticeship – Software Developer Occupational Brief. UK <http://www.e-skills.com/apprenticeships/trailblazer-consultation/>

Software Developer Occupational Competency Training Plan

Related Instruction means an organized and systematic form of instruction designed to provide the apprentice with the knowledge of the theoretical and technical subjects related to the apprentice's trade of occupation, or industrial courses or, when of equivalent value, by correspondence, electronic media, or other forms or self-study approved by the commissioner.

	Course	Course Description	Credit/Non-Credit	Hours Spent on Competency
Bash Shell Scripting				
Software Testing				
Software Analysis & Design				
Programming				
Service Orientated Architectures				
Logic				
Object Orientated Programming				
Databases				

Version control				
Data Structures & Algorithms				
Operating Systems				
Unified Modeling Language				
Knowledge of Encryption				
Waterfall & Agile Software Dev. Life Cycle				
Client/Server Architecture				
<i>On-The-Job Training is the work experience and instruction. Training experience need not be in the exact order as listed below.</i>				
	Trainer/Instructor	Name of person responsible for verifying competency mastery	Hours Spent on Competency	
Unit & Integration Testing				
Coordinates Software Installation				

Server Automation Tools			
Software Testing (On the Job)			
Learn and Implement Design Patterns			
Bug Fixing/De-Bugging			
Quality Assurance			
Integrated Development Environment			
Monitor Equipment Functioning			
Continuous Integration			
Translating Technical Docs into Actionable Work			
Store, Retrieve & Manipulate Data for Analysis of System Capabilities and Requirements			

Customer Consultation re: System Design & Maintenance			
Design, Develop & Modify Software Systems - Hands-On			
Defensive Programming			
Understanding Developments Role in Cross-functional Teams			

MINNESOTA PIPELINE PROJECT

PRIVATE INVESTMENT, PUBLIC EDUCATION LABOR AND INDUSTRY EXPERIENCE

Web Developer Back End – A Back End Web Developer is one who specializes in the development of websites and webpages, primarily the behind the scenes coding and programming.

Industry-Sector Technical Competencies

- Bash Shell Scripting – Knowledge of scripting a UNIX shell or command language.
- Software Testing – Knowledge of how to evaluate software to make sure it meets specified requirements. Also to identify any gaps, errors or missing requirements.
- Software Analysis and Design – Understanding of modeling and its central role in eliciting, understanding, analyzing and communicating software requirements, architecture and design.
- Programming – Training to create programs by writing "code" in a certain programming language.
- Service Oriented Architectures – Understand the architectural pattern in computer software design in which application components provide services to other components via a communications protocol, typically over a network.
- Logic – Training in the part of the program that encodes the real-world business rules that determine how data can be created, displayed, stored, and changed.
- Object Oriented Programming – Understanding this type of programming in which programmers define not only the data type of a data structure, but also the types of operations (functions) that can be applied to the data structure.
- Databases – Knowledge of implementing data models and database designs to ensure security and data integrity in database software.
- Version Control – Understanding of the system that records changes to a file or set of files over time so that you can recall specific versions later.
- Data Structures & Algorithms – Knowledge of the use of data structures and algorithms in software programming for web design.
- Operating Systems – Understand the function of operating systems and how to properly create websites to interact with them.
- Unified Modeling Language – Understanding of the general-purpose modeling language for website engineering, designed to provide a standard way to visualize the design of a system.

- Knowledge of Encryption – Understanding of how encryption functions and how to work with it within the website development environment.
- Software Development Life Cycle – Knowledge of Waterfall and Agile approaches to software development and when to use the appropriate model.
- Client/Server Architecture – Knowledge of the Client/Server Architecture model and how to develop websites for such a system.
- Web Programming Language – Knowledge of the common formatting and programming languages – HTML, CSS, JavaScript.

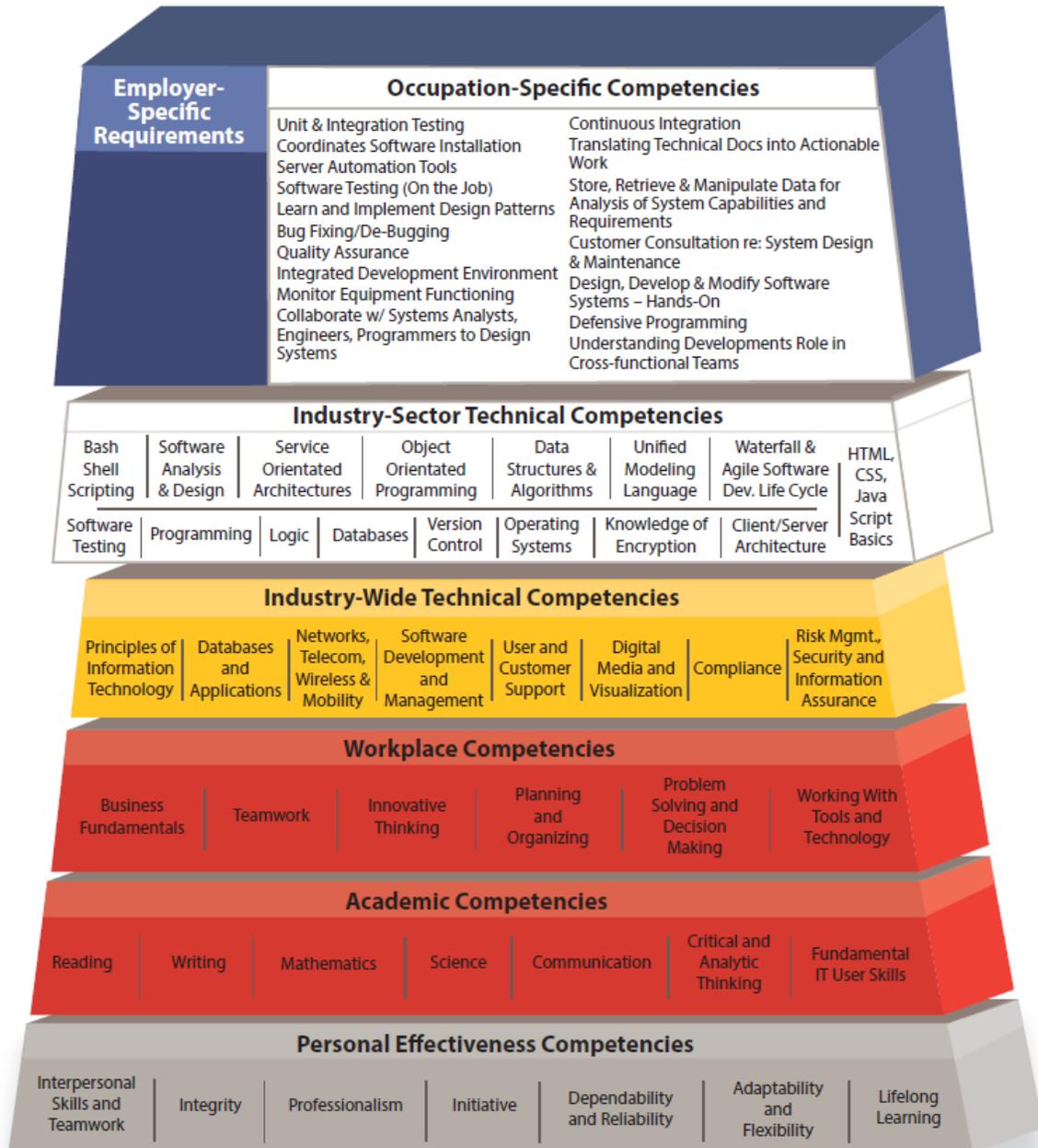
Occupation-Specific Competencies

- Unit & Integration Testing – Able to test various computing scenarios for units and integration.
- Coordinate Software Installation – Assist with software installation for the organization and individual user.
- Server Automation Tools – Know how to use applications which automate computing functions.
- Software Testing (On The Job) – Ability to run tests on software and test for compatibility and functionality issues.
- Learn and Implement Design Patterns – Use design patterns for problem solving in programming.
- Bug Fixing/De-Bugging – Ability to locate, fix or bypass errors (bugs) in code or devices.
- Quality Assurance – Use appropriate methods to verify overall quality of website design and system work.
- Integrated Development Environment – Use the IDE application for website development.
- Monitor Equipment Functioning – Monitor system for reviewing information from system to detect or assess problems.
- Continuous Integration – Merge developer working copies with a shared mainline several times a day.
- Collaborate for System Design – Ability to collaborate with the development team which may include systems analysts, engineers and programmers.
- Translating Technical Docs Into Actionable Work – Understand how to create working process documents from very technical IT documents.
- Data Analysis – Store, retrieve and manipulate data for analysis of system capabilities and requirements.
- Customer Consultation - Work with internal and external customers to gather information regarding system design and maintenance.
- Software Systems – Demonstrate ability to design, develop and modify software systems.

- Defensive Programming – Ability to design model intended to ensure the continuing function of a website under unforeseen circumstances.
- Cross-Functional Teams – Understand the web development role while working with cross-functional teams.

PIPELINE Project

Competency Model for Information Technology Occupation: Web Developer - Back End



Based on: Information Technology Competency Model Employment and Training Administration, United State Department of Labor, September 2012 and Digital Industries Trailblazer Apprenticeship – Software Developer Occupational Brief. UK <http://www.e-skills.com/apprenticeships/trailblazer-consultation/>

Web Developer – Back End Occupational Competency Training Plan

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	Course	Course Description	Credit/Non-Credit	Hours Spent on Competency
Bash Shell Scripting				
Software Testing				
Software Analysis & Design				
Programming				
Service Orientated Architectures				
Logic				
Object Orientated Programming				
Databases				

Version control				
Data Structures & Algorithms				
Operating Systems				
Unified Modeling Language				
Knowledge of Encryption				
Software Development Life Cycle				
Client/Server Architecture				
Web Programming Language				

***On-The-Job Training** is the work experience and instruction. Training experience need not be in the exact order as listed below.*

	Trainer/Instructor	Name of person responsible for verifying competency mastery	Hours Spent on Competency
Unit & Integration Testing			
Coordinates Software Installation			
Server Automation Tools			
Software Testing (On The Job)			
Learn and Implement Design Patterns			
Bug Fixing/De-bugging			
Quality Assurance			
Integrated Development Environment			
Monitor Equipment Functioning			

Collaborate w/ Systems Analysts, Engineers, Programmers to Design Systems			
Continuous Integration			
Translating Technical Docs into Actionable Work			
Store, Retrieve & Manipulate Data for Analysis of System Capabilities and Requirements			
Customer Consultation re: System Design & Maintenance			
Design, Develop & Modify Software Systems – Hands-On			
Defensive Programming			
Understanding Developments Role in Cross-functional Teams			

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PRIVATE INVESTMENT, PUBLIC EDUCATION LABOR AND INDUSTRY EXPERIENCE

Web Developer Front End – A Front End Web Developer is one who specializes in the development of websites and webpages, primarily the human interface applications and design aspects.

Industry-Sector Technical Competencies

- Bash Shell Scripting – Knowledge of scripting a UNIX shell or command language.
- Software Testing – Knowledge of how to evaluate software to make sure it meets specified requirements. Also to identify any gaps, errors or missing requirements.
- Software Analysis and Design – Understanding of modeling and its central role in eliciting, understanding, analyzing and communicating software requirements, architecture and design.
- Programming – Training to create programs by writing "code" in a certain programming language.
- Service Oriented Architectures – Understand the architectural pattern in computer software design in which application components provide services to other components via a communications protocol, typically over a network.
- Logic – Training in the part of the program that encodes the real-world business rules that determine how data can be created, displayed, stored, and changed.
- Object Orientated Programming – Understanding this type of programming in which programmers define not only the data type of a data structure, but also the types of operations (functions) that can be applied to the data structure.
- Databases – Knowledge of implementing data models and database designs to ensure security and data integrity in database software.
- Version Control – Understanding of the system that records changes to a file or set of files over time so that you can recall specific versions later.
- Data Structures & Algorithms – Knowledge of the use of data structures and algorithms in web design.
- Operating Systems – Understand the function of operating systems and how to properly create websites to interact with them.
- Unified Modeling Language – Understanding of the general-purpose modeling language for software engineering, designed to provide a standard way to visualize the design of a system.

- Knowledge of Encryption – Understanding of how encryption functions and how to work with it within the website development environment.
- Software Development Life Cycle – Knowledge of Waterfall and Agile approaches to software development and when to use the appropriate model.
- Client/Server Architecture – Knowledge of the Client/Server Architecture model and how to develop websites for such a system.
- Accessibility – Have a basic knowledge of accessibility and how to incorporate it into websites.
- Computer/Human Interaction – Understanding of the fundamentals of computer/human interaction.
- Web Programming Language – Knowledge of the common formatting and programming languages – HTML, CSS, JavaScript.

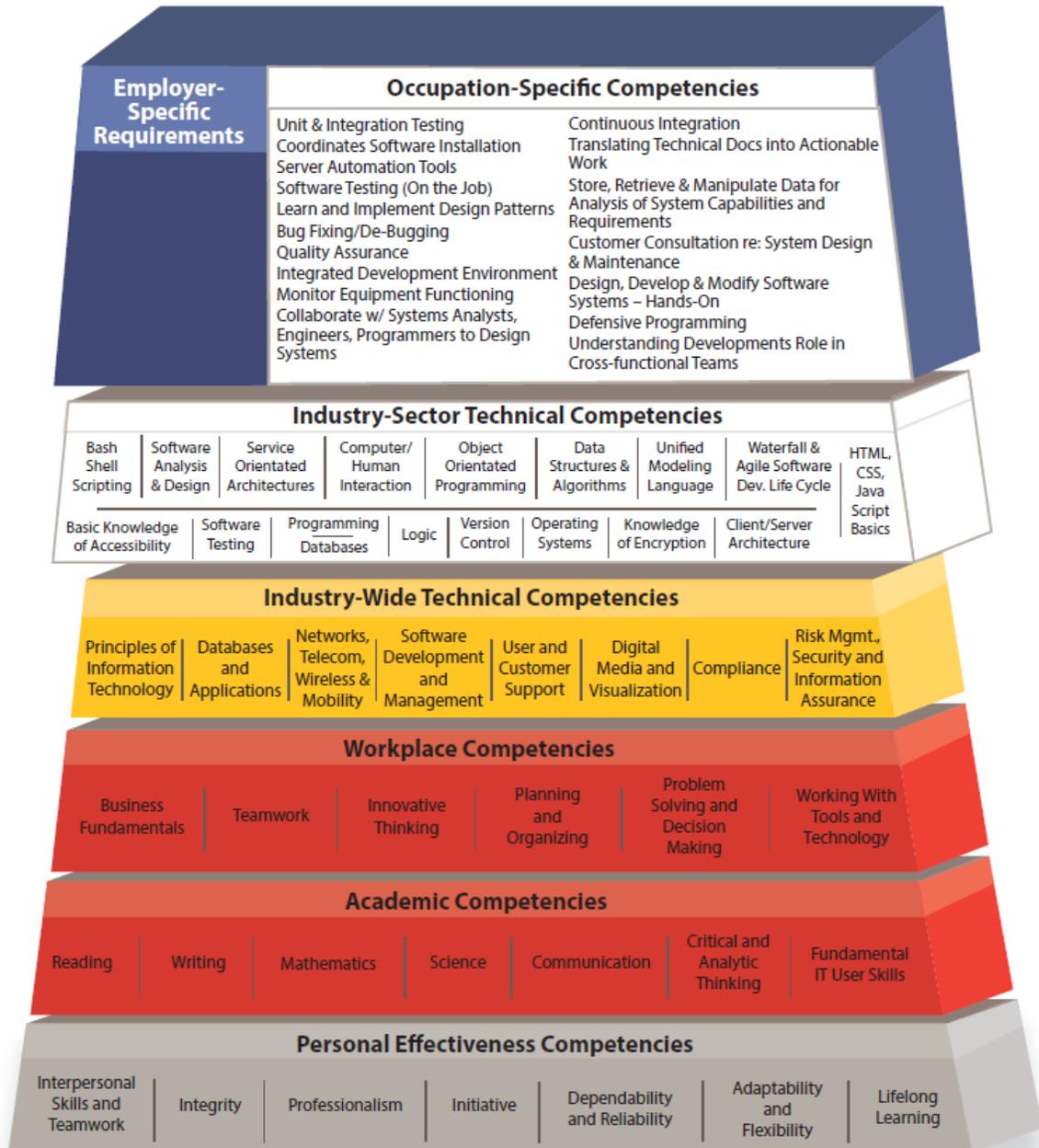
Occupation-Specific Competencies

- Unit & Integration Testing – Able to test various computing scenarios for units and integration.
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- Quality Assurance – Use appropriate methods to verify overall quality of website design and system work.
- Integrated Development Environment – Use the IDE application for website development.
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- Software Systems – Demonstrate ability to design, develop and modify software systems.
- Defensive Programming – Ability to design model intended to ensure the continuing function of a website under unforeseen circumstances.
- Cross-Functional Teams – Understand the web development role while working with cross-functional teams.

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Competency Model for Information Technology Occupation: Web Developer - Front End



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Web Developer – Front End Occupational Competency Training Plan

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Programming				
Service Orientated Architectures				
Logic				
Object Orientated Programming				
Databases				

Version Control				
Data Structures & Algorithms				
Operating Systems				
Unified Modeling Language				
Knowledge of Encryption				
Software Development Life Cycle				
Client/Server Architecture				
Accessibility				
Computer/Human Language				
Web Programming Language				

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Coordinates Software Installation			
Server Automation Tools			
Software Testing (On The Job)			
Learn and Implement Design Patterns			
Bug Fixing/De-bugging			
Quality Assurance			
Integrated Development Environment			
Monitor Equipment Functioning			

Collaborate w/ Systems Analysts, Engineers, Programmers to Design Systems			
Continuous Integration			
Translating Technical Docs into Actionable Work			
Store, Retrieve & Manipulate Data for Analysis of System Capabilities and Requirements			
Customer Consultation re: System Design & Maintenance			
Design, Develop & Modify Software Systems – Hands-On			
Defensive Programming			
Understanding Developments Role in Cross-functional Teams			