

State of California

# IT Personnel *Professional Development*

June 24, 2005

Prepared by ITMA XII



Information Systems Security Administration

Application Software Development

Customer Technical Support

Database Development & Support

Network / Client Server Administration

**CURRICULUM**

Web / Internet Development

Enterprise Systems Support

**& Catalog**

Emerging IT

IT Business Consultant

IT Technical Document Writer

IT Project Manager

# BACKGROUND

## ABOUT ITMA

The Information Technology Managers Academy (ITMA) is an intensive, year long, program. It focuses on developing the skills and knowledge that effective IT executives need to succeed in the 21st Century.



The ITMA began in January 1990 as a result of a study that recommended the implementation of an Information Technology Management Academy. The ITMA has two main objectives:

1. To enhance the "Business" and "Management" skills of State technology managers and to prepare them for executive roles.
2. To provide visibility and networking opportunities to the participants in the academy.

In addition to the academic calendar, each academy is responsible for producing a class project.

## CURRICULUM & CATALOG PURPOSE

The intent of the Curriculum and Catalog is to recommend a curriculum path, competencies and applicable courses to assist managers with staff development and individuals with their career development. The Curriculum and Catalog are to be used as a reference guide, not mandatory training or paths, but as a starting point to develop a comprehensive training plan, which addresses department and staff needs and provides a consistent statewide approach.

## BENEFITS TO YOU

Well-trained IT staff equate to a more functional, efficient and cost effective organization. The information contained in the Curriculum and Catalog is designed to provide a foundation upon which departments, managers and staff may utilize to gain numerous benefits.

1. Assists with the development of IT personnel
2. Provides a means to develop a training plan for IT personnel
3. Serves as a guide to appropriate training in functional areas
4. Provides consistent statewide training development approach
5. Ensures standardized skill expectations for various IT levels
6. Supports upward mobility and career development
7. Provides suggested courses to develop soft-skills in addition to technical skills
8. Develops and improves IT knowledge and abilities
9. Responds to Goal 5, Objective 3 of the State IT Strategic Plan

## THE ITMA XII CLASS PROJECT

The State of California's IT Strategic Plan acknowledges the need to develop and rebuild the State's technology workforce. In support of Goal 5— Objective 3 of the California IT Strategic Plan, the members of ITMA XII chose to develop a training curriculum and course catalog for IT personnel as a class project. The project is entitled "Professional Development for Technology Personnel." The curriculum and course catalog on CD represent the results of a 12-month effort.



To document the competencies for each IT functional area, a survey was developed validating results from a number of sources including a 1999 Department of Personnel Administration classification study and subsequent work with a Unit I Labor Management Committee. The Curriculum and Catalog were developed based on a detailed analysis of the survey results.

The Curriculum and Catalog adopted the following functional areas:

1. Application Software Development
2. Customer Technical Support
3. Database Development and Administration
4. Emerging IT
5. Enterprise Systems Support
6. Information Systems Security Administration
7. IT Business Consultant
8. IT Project Manager
9. IT Technical Document Writer
10. Network / Client Server Administration
11. Web / Internet Development

# DISCLAIMER

*The State of California and ITMA XII does not imply that the use of the Curriculum, Catalog or the enrollment in courses ensures promotion or readiness for promotion. Additionally, the State of California and ITMA XII does not endorse any specific training vendors included or excluded from the Catalog CD nor assumes responsibility for the quality of the trainers or course content.*

## **CURRICULUM**

The intent of the Curriculum is to recommend knowledge and abilities that will directly benefit departments, managers and staff by enhancing the skillsets of State staff. The contents are simply a guide, it is not mandated nor required training, but will help guide staff down a refined or new path to better compliment current IT knowledge. The Curriculum can be very helpful in considering other areas of interest in the IT arena or provide invaluable cross training information. As a reference guide, it can assist non-IT staff towards careers in the IT field. This Curriculum is a reference guide only and has not been adopted by the State IT community as of June 24, 2005.

## **CATALOG CD**

The suggested training offered in the Catalog are the results of an extensive research conducted by ITMA XII and is only a sample of what is currently available as of June 24, 2005. The Catalog is not to be considered a complete or comprehensive listing of classes/courses and vendors. There may be additional vendors that can provide like classes in a specific functional area. The course costs listed in this catalog are a point in time only. Users of this catalog should contact the vendor of interest to obtain updated costs and course availability.

# Table of ***CONTENTS***

**5**  
CURRICULUM  
INSTRUCTIONS

**6**  
CATALOG CD  
INSTRUCTIONS

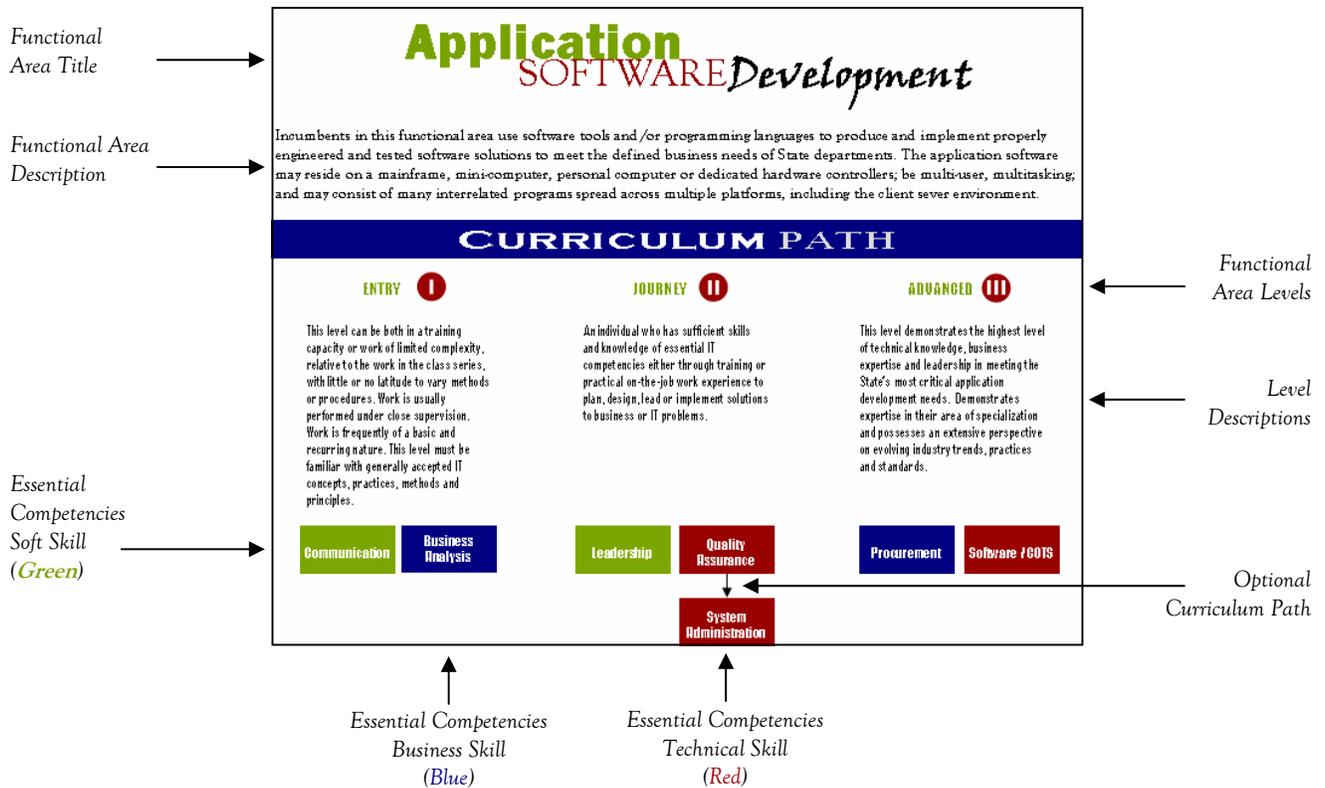
**62**  
NON TECHNICAL  
TRAINING

**67**  
SPECIAL  
APPRECIATION

## **FUNCTIONAL AREAS**

- 7** Application Software Development
- 11** Customer Technical Support
- 15** Database Development and Administration
- 21** Emerging Information Technology
- 25** Enterprise Systems Support
- 30** Information Systems Security Administration
- 34** IT Business Consultant
- 40** IT Project Manager
- 46** IT Technical Document Writer
- 50** Network / Client Server Administration
- 56** Web / Internet Development

# How to Read this Curriculum



# How to Use and Read the *Catalog CD*

The Catalog CD contains over 1,000 records of training courses, websites, groups and other resources currently available.

\* You can use these functionalities once you save a copy of the electronic Catalog on your local drive.

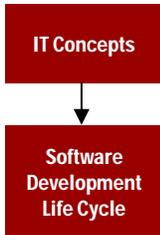
# Application SOFTWARE Development

Incumbents in this functional area use software tools and/or programming languages to produce and implement properly engineered and tested software solutions to meet the defined business needs of State departments. The application software may reside on a mainframe, mini-computer, personal computer or dedicated hardware controllers; be multi-user, multitasking; and may consist of many interrelated programs spread across multiple platforms, including the client sever environment.

## CURRICULUM PATH

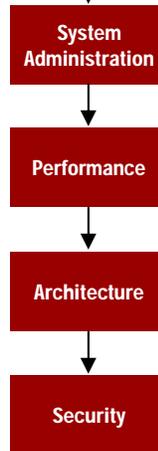
### ENTRY I

This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature. This level must be familiar with generally accepted IT concepts, practices, methods and principles.



### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.



### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical application development needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.



#### LEGEND



Note: Competencies are progressive and are reflected at the earliest level.



# Application SOFTWARE Development

## ESSENTIAL Competencies

### Ability to

#### Soft Skills

- communicate factual and procedural information clearly, orally and in writing

#### Business Skills

- gather and analyze basic facts and draw conclusions

#### Technical Skills

- perform highly structured entry-level work designed to develop broader and more in depth knowledge and skills needed to perform programming assignments

### Knowledge of

#### Technical Skills

- IT systems development life cycle management concepts

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- prepare and present reports
- represent the organization in interactions with other organizations

#### Business Skills

- conduct analyses and recommend resolutions of complex issues affecting the specialty area
- ensure applications are consistent with the current and planned infrastructure and data environments
- evaluate proposals for the acquisition of IT products or services
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- learn the mission and programs of customer organizations
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures
- provide technical direction/leadership of program or project work
- provide technical leadership on group projects

#### Technical Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new application software theories, concepts, principles, standards, methods, or practices
- design and develop efficient and effective application through the use of reusable components
- design, write, test, debug, and maintain software applications that meet technical and functional requirements
- develop new theories, concepts, standards and methodologies in application software development
- develop, execute, and evaluate application test scenarios for the ultimate development of an efficient application
- ensure optimal use of commercially available products
- ensure that applications comply with regulatory requirements
- evaluate and recommend adoption of new or enhanced approaches to delivery IT services
- gather data to analyze system utilization, capacity, and performance for the development of an application
- interpret programming policies, standards, and guidelines
- participate in the design, development, testing, and implementation of new or modified applications software, perform detailed analysis of applications used to ensure that information provided meets the unit's requirements and expectations
- provide advice and guidance on a wide range and variety of complex programming issues
- provide first technical response to users to resolve application program problems
- provide guidance in order to ensure that applications are optimized for state-of-the-art technology and functionality
- test and optimize the functionality of systems, networks, and data

### Knowledge of

#### Soft Skills

- oral and written communication techniques

#### Business Skills

- acquisition management policies and procedures
- advanced systems development concepts including structured design, supportability, survivability, reliability, scalability, and maintainability
- analytical techniques and methodologies to ensure business requirements are met and in accordance to departmental standards
- cost-benefit analysis principles and methods
- IT project management principles and method
- requirement analysis principles and methods

#### Technical Skills

- application backup and recovery procedures
- application software development principles and methods
- basic IT principles and practices, general computer architecture (CPU, memory allocation, peripheral devices, I/O, etc., in order to perform basic programming functions, and basic arithmetic (binary, hexadecimal, etc.)
- basics of operating systems and hardware
- Custom Off-the-Shelf (COTS) products and components
- database management principles and methodologies, including data structures, data modeling, data warehousing, and transaction processing
- database management principles and methods as used on the internet
- generally accepted IT concepts, practices, methods, and principles
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- interrelationships between applications and networking components to ensure efficiency and optimal program performance in the system
- IT change management practices and their application in the application software development environment
- IT practices and methods (current and trends) for IT strategic planning
- new and emerging application software technologies and/or industry trends
- performance management/measurement methods, tools, and techniques
- principles, methods, and procedures for designing, developing, optimizing, and integrating new and/or reusable systems components
- programming languages, testing procedures, concepts, and techniques
- systems testing and evaluation principles, methods and tools
- the development lifecycle in order to develop effective programs



# Application SOFTWARE Development

## ESSENTIAL Competencies

in addition to entry level essential competencies

### Ability to

#### Soft Skills

- prepare and present reports
- represent the organization in interactions with other organizations

#### Business Skills

- conduct analyses and recommend resolutions of complex issues affecting the specialty area
- ensure that applications comply with regulatory requirements
- learn the mission and programs of customer organizations

#### Technical Skills

- design and develop efficient and effective application through the use of reusable components
- design, write, test, debug, and maintain software applications that meet technical and functional requirements
- develop, execute, and evaluate application test scenarios for the ultimate development of an efficient application
- ensure applications are consistent with the current and planned infrastructure and data environments
- gather data to analyze system utilization, capacity, and performance for the development of an application
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- interpret programming policies, standards, and guidelines
- participate in the design, development, testing, and implementation of new or modified applications software, perform detailed analysis of applications used to ensure that information provided meets the unit's requirements and expectations
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures
- provide advice and guidance on a wide range and variety of complex programming issues
- provide first technical response to users to resolve application program problems
- provide technical direction/leadership of program or project work
- provide technical leadership on group projects
- test and optimize the functionality of systems, networks, and data

### Knowledge of

#### Soft Skills

- oral and written communication techniques

#### Business Skills

- analytical techniques and methodologies to ensure business requirements are met and in accordance to departmental standards
- cost-benefit analysis principles and methods
- requirement analysis principles and methods

#### Technical Skills

- application backup and recovery procedures
- application software development principles and methods
- basic IT principles and practices, general computer architecture (CPU, memory allocation, peripheral devices, I/O, etc., in order to perform basic programming functions, and basic arithmetic (binary, hexadecimal, etc.)
- basics of operating systems and hardware
- database management principles and methodologies, including data structures, data modeling, data warehousing, and transaction processing
- generally accepted IT concepts, practices, methods, and principles
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- interrelationships between applications and networking components to ensure efficiency and optimal program performance in the system
- IT change management practices and their application in the application software development environment
- principles, methods, and procedures for designing, developing, optimizing, and integrating new and/or reusable systems components
- programming languages, testing procedures, concepts, and techniques
- systems testing and evaluation principles, methods and tools
- development lifecycle in order to develop effective programs

## DESIRABLE Competencies

### Ability to

#### Technical Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new application software theories, concepts, principles, standards, methods, or practices
- develop new theories, concepts, standards and methodologies in application software development
- ensure optimal use of commercially available products
- evaluate and recommend adoption of new or enhanced approaches to delivery IT services
- evaluate proposals for the acquisition of IT products or services
- provide guidance in order to ensure that applications are optimized for state-of-the-art technology and functionality

### Knowledge of

#### Business Skills

- acquisition management policies and procedures

#### Technical Skills

- advanced systems development concepts including structured design, supportability, survivability, reliability, scalability, and maintainability
- Custom Off-the-Shelf (COTS) products and components
- database management principles and methods as used on the internet
- IT practices and methods (current and trends) for IT strategic planning
- IT project management principles and method
- new and emerging application software technologies and/or industry trends
- performance management/measurement methods, tools, and techniques



# Application SOFTWARE Development

## **ESSENTIAL** Competencies

in addition to entry & journey level essential competencies

### Ability to

#### Technical Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new application software theories, concepts, principles, standards, methods, or practices
- develop new theories, concepts, standards and methodologies in application software development
- ensure optimal use of commercially available products
- evaluate and recommend adoption of new or enhanced approaches to delivery IT services
- evaluate proposals for the acquisition of IT products or services
- provide guidance in order to ensure that applications are optimized for state-of-the-art technology and functionality

### Knowledge of

#### Business Skills

- cost-benefit analysis principles and methods

#### Technical Skills

- acquisition management policies and procedures
- advanced systems development concepts including structured design, supportability, survivability, reliability, scalability, and maintainability
- Custom Off-the-Shelf (COTS) products and components
- database management principles and methods as used on the internet
- IT practices and methods (current and trends) for IT strategic planning
- IT project management principles and method
- new and emerging application software technologies and/or industry trends
- performance management/measurement methods, tools, and techniques

## **DESIRABLE** Competencies

### Ability to

Refer to Entry and Journey Level Competencies

### Knowledge of

Refer to Entry and Journey Level Competencies

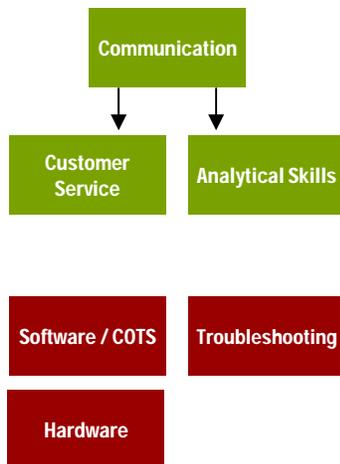
# Customer Technical Support

Incumbents in this functional area serve both internal and external clients and are responsible to troubleshoot, provide facilitation and customer service, carry out hardware and software installation, configuration and upgrades, and perform systems resolution, monitoring and maintenance.

## CURRICULUM PATH

### ENTRY I

This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature.



### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.



### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical customer technical support needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.



#### LEGEND



Note: Competencies are progressive and are reflected at the earliest level.



# Customer Technical Support

## ESSENTIAL Competencies

### Ability to

#### Soft Skills

- communicate factual and procedural information clearly; orally and in writing

#### Technical Skills

- perform highly structured, entry-level work designed to develop broader and more in-depth knowledge and skill needed to respond to customer hardware and/or software help requests
- gather and analyze basic facts and draw conclusions
- provide support in a manner that minimizes interruptions in customers' carry out critical business activities

### Knowledge of

#### Business Skills

- customer service and customer support principles in an IT environment

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- effectively report, respond to, and resolve customer technical support requests
- prepare and present reports
- present formal and informal training and assistance to customers

#### Business Skills

- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- evaluate proposals for the acquisition of IT products or services
- evaluate the feasibility of adapting new methods to enhance customer satisfaction related to IT technical problem resolution
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- interpret IT policies, standards, and guidelines
- learn the missions and programs of customer organizations
- participate in the planning and delivery of a full range of IT customer support services to the organization
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures
- plan, implement and manage problem management systems designed to effectively recognize, report, track, and resolve problems
- represent the organization in interactions with other organizations

#### Technical Skills

- conduct analyses and recommend resolution of complex issues affecting the specialty area
- ensure optimal use of commercially available products
- install, configure, upgrade, and troubleshoot hardware and software components
- provide advice and assistance to customers related to resolution of complex technical hardware and/or software problems
- provide advice and guidance on a wide range and variety of complex IT issues
- provide guidance in order to determine hardware and operating system resource requirements for the larger and more complex systems within the organization
- provide technical direction/leadership of program or project work
- provide technical leadership in group projects
- test and optimize the functionality of systems, networks, and data
- troubleshoot complex technical problems

### Knowledge of

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods
- current trends for IT strategic planning
- IT performance monitoring principles and methods
- IT problem management methods and practices
- IT quality assurance principles
- new and innovative customer support methods and techniques
- performance management/measurement methods, tools and techniques
- principles of organizational development and financial management and IT change management practices
- requirement analysis principles and methods

#### Technical Skills

- a wide variety of applications, operating systems, protocols, and equipment used in customer organizations
- basics of operating systems and hardware, client side support and server side support
- Customized Off-the-Shelf (COTS) products and components
- database management principles and methods
- general computer architecture (CPU, memory allocation, peripheral devices, I/O, etc. in order to perform basic technical support functions)
- generally accepted IT concepts, practices, methods and principles
- IT principles and practices
- IT project management principles and methods
- IT systems development life cycle management concepts
- IT systems installed in customer organizations
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- IT training methods, and knowledge-based applications
- methods and practices for troubleshooting, recovering, adjusting, modifying and improving IT systems
- network operating systems and asset management software
- new and emerging IT and/or industry trends
- PC diagnostic and tuning tools
- systems testing and evaluation principles, methods and tools



# Customer Technical Support

## **ESSENTIAL** Competencies

in addition to entry level essential competencies

### Ability to

#### Soft Skills

- effectively report, respond to, and resolve customer technical support requests
- prepare and present reports
- present formal and informal training and assistance to customers

#### Business Skills

- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- evaluate the feasibility of adapting new methods to enhance customer satisfaction related to IT technical problem resolution
- interpret IT policies, standards, and guidelines
- learn the missions and programs of customer organizations
- participate in the planning and delivery of a full range of IT customer support services to the organization
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures

#### Technical Skills

- conduct analyses and recommend resolution of complex issues affecting the specialty area
- ensure optimal use of commercially available products
- install, configure, upgrade, and troubleshoot hardware and software components
- provide advice and assistance to customers related to resolution of complex technical hardware and/or software problems
- provide advice and guidance on a wide range and variety of complex IT issues
- provide technical leadership in group projects
- test and optimize the functionality of systems, networks, and data
- troubleshoot complex technical problems

### Knowledge of

#### Business Skills

- IT performance monitoring principles and methods
- IT problem management methods and practices
- IT quality assurance principles
- new and innovative customer support methods and techniques
- performance management/measurement methods, tools and techniques

#### Technical Skills

- a wide variety of applications, operating systems, protocols, and equipment used in customer organizations
- basics of operating systems and hardware, client side support and server side support
- Customized Off-the-Shelf (COTS) products and components
- general computer architecture (CPU, memory allocation, peripheral devices, I/O, etc. in order to perform basic technical support functions)
- generally accepted IT concepts, practices, methods and principles
- IT principles and practices
- IT systems installed in customer organizations
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- IT training methods, and knowledge-based applications
- methods and practices for troubleshooting, recovering, adjusting, modifying and improving IT systems
- network operating systems and asset management software
- PC diagnostic and tuning tools
- systems testing and evaluation principles, methods and tools

## **DESIRABLE** Competencies

### Ability to

#### Business Skills

- evaluate proposals for the acquisition of IT products or services
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- plan, implement and manage problem management systems designed to effectively recognize, report, track, and resolve problems
- represent the organization in interactions with other organizations

#### Technical Skills

- provide guidance in order to determine hardware and operating system resource requirements for the larger and more complex systems within the organization
- provide technical direction/leadership of program or project work

### Knowledge of

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods
- current trends for IT strategic planning
- principles of organizational development and financial management and IT change management practices
- requirement analysis principles and methods

#### Technical Skills

- database management principles and methods
- IT project management principles and methods
- IT systems development life cycle management concepts
- new and emerging IT and/or industry trends



# Customer Technical Support

## ESSENTIAL Competencies#

in addition to entry & journey level essential competencies

### Ability to

#### Business Skills

- evaluate proposals for the acquisition of IT products or services
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- plan, implement and manage problem management systems designed to effectively recognize, report, track, and resolve problems
- represent the organization in interactions with other organizations

#### Technical Skills

- provide guidance in order to determine hardware and operating system resource requirements for the larger and more complex systems within the organization
- provide technical leadership in group projects

### Knowledge of

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods
- current trends for IT strategic planning
- principles of organizational development and financial management and IT change management practices
- requirement analysis principles and methods

#### Technical Skills

- database management principles and methods
- IT project management principles and methods
- IT systems development life cycle management concepts
- new and emerging IT and/or industry trends

## DESIRABLE Competencies

### Ability to

Refer to Entry and Journey Level Competencies

### Knowledge of

Refer to Entry and Journey Level Competencies

# Database

## Development & Administration

Incumbents in this functional area perform work that involves the planning, designing, developing, testing, implementing, and administering of database systems for the acquisition, storage, and retrieval of data. The database may reside on a mainframe, mini-computer, or personal computer, be multi-user, multitasking, and may consist of many interrelated programs spread across multiple platforms. At the more advanced levels incumbents develop and administer policies and procedures for evaluating, selecting, and integrating database management systems. They also troubleshoot multiple database management systems and integrate the business data and process models into the enterprise model.

### CURRICULUM PATH

#### ENTRY I

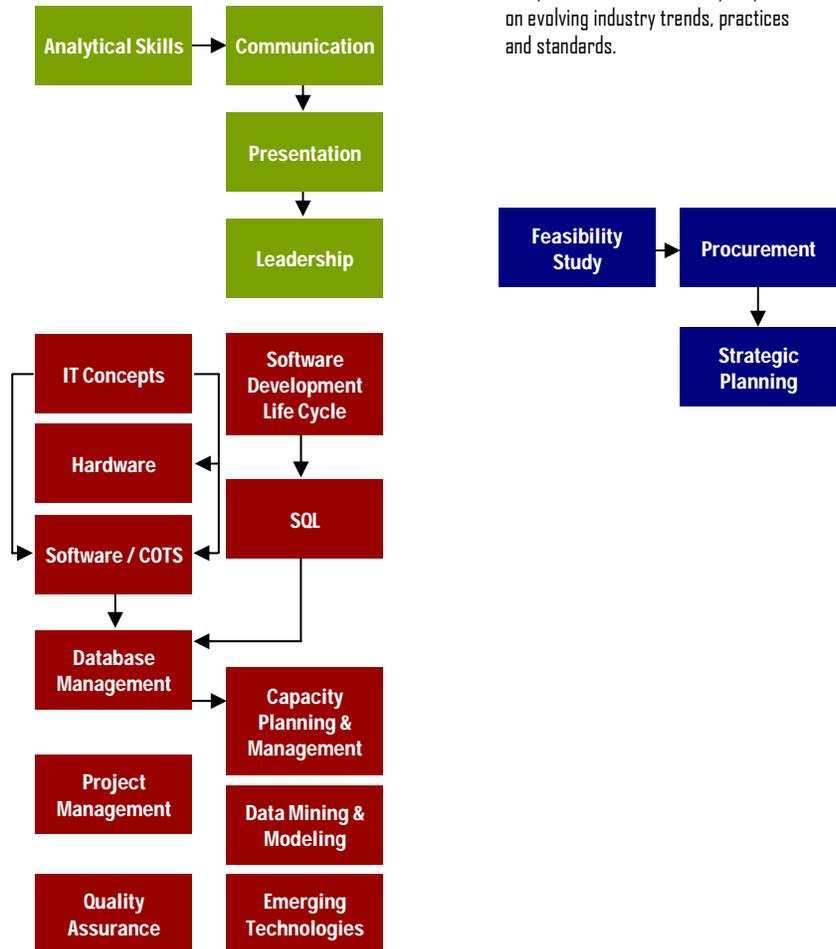
This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature. This level must be familiar with generally accepted IT concepts, practices, methods and principles.

#### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.

#### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical application development needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.



#### LEGEND



Note: Competencies are progressive and are reflected at the earliest level.



# Database

## Development & Administration

### ESSENTIAL *Competencies*

Ability to

No Essential Competencies Exist— Refer to Desirable Competencies

Knowledge of

No Essential Competencies Exist— Refer to Desirable Competencies

### DESIRABLE **Competencies**

Ability to

#### Soft Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices, that are developed by the applicant or the applicant's leadership
- conduct analyses and recommend resolution of complex issues affecting the specialty area
- interpret database policies, standards, and guidelines
- learn the mission and programs of customer organizations
- plan and carry out difficult and complex database assignments and develop new methods, approaches, and procedures
- prepare and present reports
- provide advice and guidance on a wide range and variety of complex IT database issues
- provide technical direction of program or project work
- provide technical leadership on group projects
- represent the organization in interactions with other organizations

#### Business Skills

- evaluate proposals for the acquisition of database products or services
- identify goals and constraints, generate alternatives, consider risks and evaluate options for database development
- serve as senior expert and consultant to executive management to direct the design, development, implementation and maintenance of extremely complex statewide object oriented, relational databases in a client server environment which is networked/multi-user/multi-platform

Ability to

#### Technical Skills

- apply and adapt new and improved approaches to the design, development, and implementation of the data mining, data warehousing, and related data storage and retrieval systems
- assist in returning disrupted database systems to normal operations
- create simple reports and manipulate data in response to customer requirements
- define and allocate storage capacity in the design of data management systems
- design, develop, test, implement and maintain data management systems that meet current and future business requirements of the organization and its customers
- develop data dictionaries, data models, metadata repositories, and other data management tools
- develop database standards
- develop guidelines for the application of data modeling practices to the development of data management applications
- develop new theories, concepts, standards and methodologies in database development and administration
- ensure optimal use of commercially available database products
- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- generate complex queries and reports
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of database systems and networks
- identify and present potential security conflicts within the database environment
- identify and present security tradeoffs and risks
- identify and resolve conflict in data and requirements
- identify and resolve potential security conflicts within the database environment
- identify emerging trends and relate them to current database requirements
- maintain and monitor database operations
- monitor and optimize database performance and tune database operations
- participate in the design of data mining and data warehousing systems
- select database security design
- test and optimize the functionality of database systems
- use database forecasting methods and tools

<Entry Level Continued On Next Page >



# Database

## Development & Administration

< Entry Level Continued From Previous Page >

## DESIRABLE Competencies

### Knowledge of

#### Soft Skills

- analytical methods and practices
- oral and written communication techniques

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods
- IT practices and methods (current and trends) for IT strategic planning
- IT project management principles and methods

#### Technical Skills

- basics of operating systems hardware and software
- computer platforms and environments and the implication on database design, performance and usability issues
- Customized Off-the-Shelf (COTS) products and components
- data administration and data standardization policies and standards
- data mining and data warehousing principles
- data mining, data storage, and data warehousing concepts, methods, and technology
- data modeling policies, development standards and tools
- database backup and recovery procedures
- database management concepts, principles, and methods including database logical and physical design, normalization, storage capacity management, and backup and recovery
- database management systems, query languages, table relationships, and views
- database monitoring methodologies, maintenance tools and processes
- database security tools, strategies, procedures and implementation
- database software and associated tools
- database testing and evaluation principles, methods, and tools
- generally accepted IT concepts, practices, methods, and principles
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- IT change management theories and their application in the IT environment
- IT security principles and methods
- modeling policies and development standards
- new and emerging database technologies and/or industry trends
- performance management/measurement methods, tools, and techniques
- platforms used in customer organizations
- requirement analysis principles and methods
- sources, characteristics, and uses of the organization's data assets
- technical architecture and network topology
- the characteristics of physical and virtual data storage media



# Database

## Development & Administration

### **ESSENTIAL** *Competencies*

#### Ability to

##### Soft Skills

- conduct analyses and recommend resolution of complex issues affecting the specialty area
- interpret database policies, standards, and guidelines
- learn the mission and programs of customer organizations
- plan and carry out difficult and complex database assignments and develop new methods, approaches, and procedures
- prepare and present reports
- provide advice and guidance on a wide range and variety of complex IT database issues
- provide technical leadership on group projects
- represent the organization in interactions with other organizations

##### Business Skills

- identify goals and constraints, generate alternatives, consider risks and evaluate options for database development

##### Technical Skills

- assist in returning disrupted database systems to normal operations
- create simple reports and manipulate data in response to customer requirements
- define and allocate storage capacity in the design of data management systems
- design, develop, test, implement and maintain data management systems that meet current and future business requirements of the organization and its customers
- develop data dictionaries, data models, metadata repositories, and other data management tools
- develop database standards
- ensure optimal use of commercially available database products
- generate complex queries and reports
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of database systems and networks
- identify and present potential security conflicts within the database environment
- identify and present security tradeoffs and risks
- identify and resolve conflict in data and requirements
- identify and resolve potential security conflicts within the database environment
- identify emerging trends and relate them to current database requirements
- maintain and monitor database operations
- monitor and optimize database performance and tune database operations
- select database security design
- test and optimize the functionality of database systems

#### Knowledge of

##### Soft Skills

- analytical methods and practices
- oral and written communication techniques

##### Technical Skills

- basics of operating systems hardware and software
- computer platforms and environments and the implication on database design, performance and usability issues
- data administration and data standardization policies and standards
- data mining, data storage, and data warehousing concepts, methods, and technology
- data modeling policies, development standards and tools
- database backup and recovery procedures
- database management concepts, principles, and methods including database logical and physical design, normalization, storage capacity management, and backup and recovery
- database management systems, query languages, table relationships, and views
- database monitoring methodologies, maintenance tools and processes
- database security tools, strategies, procedures and implementation
- database software and associated tools
- database testing and evaluation principles, methods, and tools
- generally accepted IT concepts, practices, methods, and principles
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- IT change management theories and their application in the IT environment
- IT security principles and methods
- modeling policies and development standards
- new and emerging database technologies and/or industry trends
- performance management/measurement methods, tools, and techniques
- platforms used in customer organizations
- requirement analysis principles and methods
- sources, characteristics, and uses of the organization's data assets

<Journey Level Continued On Next Page >



# Database

## Development & Administration

< Journey Level Continued From Previous Page >

### DESIRABLE Competencies

#### Ability to

##### Soft Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices, that are developed by the applicant or the applicant's leadership
- provide technical direction of program or project work

##### Business Skills

- evaluate proposals for the acquisition of database products or services
- serve as senior expert and consultant to executive management to direct the design, development, implementation and maintenance of extremely complex statewide object oriented, relational databases in a client server environment which is networked/multi-user/multi-platform

##### Technical Skills

- apply and adapt new and improved approaches to the design, development, and implementation of the data mining, data warehousing, and related data storage and retrieval systems
- develop guidelines for the application of data modeling practices to the development of data management applications
- develop new theories, concepts, standards and methodologies in database development and administration
- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- participate in the design of data mining and data warehousing systems
- use database forecasting methods and tools

#### Knowledge of

##### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods
- IT practices and methods (current and trends) for IT strategic planning
- IT project management principles and methods

##### Technical Skills

- Customized Off-the-Shelf (COTS) products and components
- data mining and data warehousing principles
- technical architecture and network topology
- the characteristics of physical and virtual data storage media



# Database

## Development & Administration

### **ESSENTIAL** *Competencies*

in addition to journey level essential competencies

#### Ability to

##### Soft Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices, that are developed by the applicant or the applicant's leadership
- conduct analyses and recommend resolution of complex issues affecting the specialty area
- provide technical direction of program or project work
- provide technical leadership on group projects

##### Business Skills

- evaluate proposals for the acquisition of database products or services
- serve as senior expert and consultant to executive management to direct the design, development, implementation and maintenance of extremely complex statewide object oriented, relational databases in a client server environment which is networked/multi-user/multi-platform

##### Technical Skills

- apply and adapt new and improved approaches to the design, development, and implementation of the data mining, data warehousing, and related data storage and retrieval systems
- develop guidelines for the application of data modeling practices to the development of data management applications
- develop new theories, concepts, standards and methodologies in database development and administration
- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- participate in the design of data mining and data warehousing systems
- use database forecasting methods and tools

#### Knowledge of

##### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods
- IT practices and methods (current and trends) for IT strategic planning

##### Technical Skills

- Customized Off-the-Shelf (COTS) products and components
- data mining and data warehousing principles
- IT project management principles and methods
- technical architecture and network topology
- the characteristics of physical and virtual data storage media

### **DESIRABLE** *Competencies*

#### Ability to

Refer to Entry and Journey Level Competencies

#### Knowledge of

Refer to Entry and Journey Level Competencies

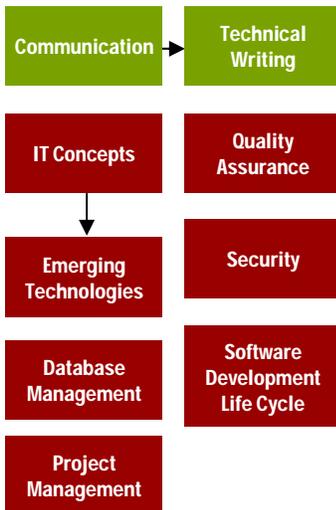
# Emerging information technology

Incumbents in this functional area research and evaluate emerging software and hardware to advance the knowledge in one or more functional areas of information systems by innovation, experimentation, evaluation and dissemination. This research is carried out using a predetermined set of objectives that are directly related to the current and future business needs of the State. Incumbents participate in the on-going assessment of new and emerging hardware and software technologies, products and information technology methods and techniques for their relevance and potential value to the organization. Incumbents participate and/or lead emerging technology development teams, participate in strategic planning activities and contribute to architectural development and business process re-engineering efforts. At the more advanced levels they will function as technical advisors and consultants to top management on a wide variety of issues related to the evaluation, design, development, testing, and implementation of emerging technologies.

## CURRICULUM PATH

### ENTRY I

This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature. This level must be familiar with generally accepted IT concepts, practices, methods and principles.



### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.



### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical application development needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.



#### LEGEND



Note: Competencies are progressive and are reflected at the earliest level.



# Emerging information technology

## ESSENTIAL Competencies

### Ability to

No Essential Competencies Exist— Refer to Desirable Competencies

### Knowledge of

No Essential Competencies Exist— Refer to Desirable Competencies

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- facilitate knowledge exchange from vendors to the State for ongoing support and maintenance of the new technologies
- provide guidance in order to advise management on the technical viability and appropriateness of emerging technology research proposals submitted by others

#### Technical Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices
- assist in the evaluation of the effectiveness of new technology solutions for solving State/departmental problems and forecasting future State/departmental enterprise needs
- determine a course of action by breaking it down into smaller steps and by planning and researching each of these, making allowance for potential problems
- develop new theories, concepts, standards and methodologies in operating systems management and administration
- evaluate, plan, deploy, and test the viability of emerging technology to complex business solutions
- lead a small IT research team in specified areas of research
- provide technical direction/leadership of program or project work
- serve as master expert and consultant to executive management to research the design, development and implementation of recommended emerging technical solutions to achieve optimal data communication capability across multiple platforms

### Knowledge of

#### Soft Skills

- IT technical documentation methods and procedures
- methods, techniques and tools for searching and obtaining relevant information from published literature, etc.
- oral and written communication techniques

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods

#### Technical Skills

- basics of operating systems and hardware, client side support and sever side support
- current trends for IT strategic planning
- customer IT requirements
- Customized Off-The Shelf (COTS) products and components
- database management principles and methods
- generally accepted IT concepts, practices, methods, and principles
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT project management principles and methods
- methods and techniques for structured reviews, including reviews of technical diagrams, test plans, business cases and any other key deliverables
- methods and techniques for structured review of all types of project deliverables
- methods, techniques and tools for searching and obtaining relevant knowledge from emerging technology published literature
- methods, techniques for the systematic design, running, analysis and reporting of results of experiments to discover a new understanding of some aspect of information systems
- new and emerging information technologies and/or industry trends
- performance management/measurement methods, tools, and techniques
- principles of organizational development and financial management and IT change management practices
- requirement analysis principles and methods
- research tools and technologies
- systems testing and evaluation principles, methods, and tools
- theory, current practice and latest developments in the field of IT, software engineering and/or information systems



# Emerging information technology

## ESSENTIAL Competencies

### Ability to

#### Technical Skills

- assist in the evaluation of the effectiveness of new technology solutions for solving State/departmental problems and forecasting future State/departmental enterprise needs
- determine a course of action by breaking it down into smaller steps and by planning and researching each of these, making allowance for potential problems
- evaluate, plan, deploy, and test the viability of emerging technology to complex business solutions

### Knowledge of

#### Soft Skills

- methods and techniques for structured reviews, including reviews of technical diagrams, test plans, business cases and any other key deliverables
- theory, current practice and latest developments in the field of IT, software engineering and/or information systems

#### Technical Skills

- basics of operating systems and hardware, client side support and sever side support
- customer IT requirements
- generally accepted IT concepts, practices, methods, and principles
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- methods, techniques and tools for searching and obtaining relevant information from published literature, etc.
- new and emerging information technologies and/or industry trends
- oral and written communication techniques
- requirement analysis principles and methods
- research tools and technologies
- systems testing and evaluation principles, methods, and tools

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- facilitate knowledge exchange from vendors to the State for ongoing support and maintenance of the new technologies
- provide guidance in order to advise management on the technical viability and appropriateness of emerging technology research proposals submitted by others

#### Technical Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices
- develop new theories, concepts, standards and methodologies in operating systems management and administration
- lead a small IT research team in specified areas of research
- provide technical direction/leadership of program or project work
- serve as master expert and consultant to executive management to research the design, development and implementation of recommended emerging technical solutions to achieve optimal data communication capability across multiple platforms

### Knowledge of

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods

#### Technical Skills

- current trends for IT strategic planning
- Customized Off-The Shelf (COTS) products and components
- database management principles and methods
- IT project management principles and methods
- methods and techniques for structured review of all types of project deliverables
- methods, techniques and tools for searching and obtaining relevant knowledge from emerging technology published literature
- methods, techniques for the systematic design, running, analysis and reporting of results of experiments to discover a new understanding of some aspect of information systems
- performance management/measurement methods, tools, and techniques
- principles of organizational development and financial management and IT change management practices



# Emerging information technology

## ESSENTIAL Competencies

in addition to journey level essential competencies

### Ability to

#### Soft Skills

- facilitate knowledge exchange from vendors to the State for ongoing support and maintenance of the new technologies
- provide guidance in order to advise management on the technical viability and appropriateness of emerging technology research proposals submitted by others

#### Technical Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices
- develop new theories, concepts, standards and methodologies in operating systems management and administration
- lead a small IT research team in specified areas of research
- provide technical direction/leadership of program or project work
- serve as master expert and consultant to executive management to research the design, development and implementation of recommended emerging technical solutions to achieve optimal data communication capability across multiple platforms

### Knowledge of

#### Soft Skills

- methods, techniques and tools for searching and obtaining relevant knowledge from emerging technology published literature

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods

#### Technical Skills

- current trends for IT strategic planning
- Customized Off-The Shelf (COTS) products and components
- database management principles and methods
- IT project management principles and methods
- methods and techniques for structured review of all types of project deliverables
- methods, techniques for the systematic design, running, analysis and reporting of results of experiments to discover a new understanding of some aspect of information systems
- performance management/measurement methods, tools, and techniques
- principles of organizational development and financial management and IT change management practices

## DESIRABLE Competencies

### Ability to

Refer to Entry and Journey Level Competencies

### Knowledge of

Refer to Entry and Journey Level Competencies

# ENTERPRISE SYSTEMS *Support*

Incumbents in this functional area serve both internal and external clients and perform a range of duties related to the evaluation, design, development, testing, and implementation of mainframe or midrange hardware, the mainframe or midrange operating system software and all supporting hardware and software solutions. Enterprise information technology systems supported include: software and hardware infrastructure and/or the connectivity capability between different platforms that manage, IT resources and support the execution of automated applications; and the installation, configuration, and maintenance of the operating systems environment that includes systems servers and operating systems software for program application.

## CURRICULUM PATH

### ENTRY I

This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature. This level must be familiar with generally accepted IT concepts, practices, methods and principles.

Communication

Analytical Skills

### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.

Feasibility Study

Systems Analysis

Software Development Life Cycle

System Management

Security

Vendor Platform Specific

Programming

Database Management

### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical application development needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.

Leadership

Procurement

Project Management

Change Management

Metrics Analysis

Strategic Planning

Capacity Planning and Management

#### LEGEND

Soft Skills

Business Skills

Technical Skills

Note: Competencies are progressive and are reflected at the earliest level.



## ESSENTIAL *Competencies*

### Ability to

#### Soft Skills

- communicate factual and procedural information clearly, orally and in writing

#### Technical Skills

- perform highly structured, entry-level work designed to develop broader and more in-depth knowledge and skill needed to respond to customer hardware and/or software help requests
- gather and analyze basic facts and draw conclusions
- use guidelines such as policies, operations manuals, and work directions

### Knowledge of

No Essential Competencies Exist— Refer to Desirable Competencies

## DESIRABLE *Competencies*

### Ability to

#### Soft Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices
- prepare and present reports
- provide guidance in order to determine hardware and operating system resource requirements for the larger and more complex systems within the organization
- provide technical direction/leadership of program or project work
- provide technical leadership on group projects
- represent the organization in interactions with other organizations

#### Business Skills

- conduct analyses and recommend resolution of complex issues affecting the specialty area
- evaluate proposals for the acquisition of enterprise products or services
- evaluate the feasibility of implementing new technologies with current environments
- learn the missions and programs of customer organizations

### Ability to

#### Technical Skills

- develop basic system specifications
- develop new theories, concepts, standards and methodologies in operating enterprise systems management and administration
- develop solutions to complex operational problems
- effectively apply knowledge in evaluating alternative proposals and recommending optimal solutions
- ensure high reliability and optimal availability of applications
- ensure optimal use of commercially available products
- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- identify and define business or technical requirements applied to the design, development, implementation, testing, evaluation, management, and support of enterprise systems and networks
- identify and specify business requirements for new or enhanced enterprise systems
- install updates or temporary fixes to existing software/hardware
- install, configure and maintain enterprise systems
- interpret IT policies, standards, and guidelines
- monitor and troubleshoot enterprise systems availability
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures
- provide advice and guidance on a wide range and variety of complex enterprise issues
- recover data in the event of hardware or software failure
- select technical tools and/or select alternatives to resolve problems or complete projects
- serve as master expert and consultant to executive management to direct the design, development and implementation of recommended technical solutions to achieve optimal enterprise system data communication capability across multiple platforms
- test and optimize the functionality of systems, networks, and data

<Entry Level Continued On Next Page >

< Entry Level Continued From Previous Page >

## DESIRABLE Competencies

### Knowledge of

#### Soft Skills

- IT technical documentation methods and procedures

#### Business Skills

- cost-benefit analysis principles and methods
- principles of organizational development and financial management and IT change management practices

### Knowledge of

#### Technical Skills

- backup and recovery procedures
- basic IT principles and practices
- basics of operating systems and hardware
- capacity management principles, concepts and tools
- current trends for IT strategic planning, acquisition management policies and procedures
- Customized Off-the Shelf (COTS) enterprise products and components
- data recovery tools and techniques
- data structures, file organization, data modeling techniques, and methods for data storage and retrieval
- enterprise systems administration methods and procedures
- enterprise systems installation and configuration procedures
- enterprise systems performance monitoring principles and methods
- enterprise systems quality assurance principles
- enterprise systems security methods and procedures
- functionality and operability of current operating environment
- general computer architecture (CPU, memory allocation, peripheral devices in order to perform basic technical support functions
- general programming logic
- generally accepted IT concepts, practices, methods, and principles
- IT systems development life cycle management concepts
- IT project management principles and methods
- management/measurement methods, tools, and techniques
- modeling and simulation tools and techniques
- new and emerging enterprise system technologies and/or industry trends
- optimization concepts and methods
- requirement analysis principles and methods
- software design principles and methods
- software design theories and concepts
- software distribution tools and mechanisms
- system engineering concepts and methods
- systems testing and evaluation principles, methods, and tools



## ESSENTIAL *Competencies*

in addition to entry level essential competencies

### Ability to

#### Soft Skills

- prepare and present reports

#### Business Skills

- conduct analyses and recommend resolution of complex issues affecting the specialty area
- evaluate the feasibility of implementing new technologies with current environments
- learn the missions and programs of customer organizations

#### Technical Skills

- develop basic system specifications
- develop solutions to complex operational problems
- effectively apply knowledge in evaluating alternative proposals and recommending optimal solutions
- ensure high reliability and optimal availability of applications
- identify and define business or technical requirements applied to the design, development, implementation, testing, evaluation, management, and support of enterprise systems and networks
- identify and specify business requirements for new or enhanced enterprise systems
- install updates or temporary fixes to existing software/hardware
- install, configure and maintain enterprise systems
- interpret IT policies, standards, and guidelines
- monitor and troubleshoot enterprise systems availability
- recover data in the event of hardware or software failure
- select technical tools and/or select alternatives to resolve problems or complete projects
- test and optimize the functionality of systems, networks, and data

### Knowledge of

#### Soft Skills

- IT technical documentation methods and procedures

#### Technical Skills

- backup and recovery procedures
- basic IT principles and practices
- basics of operating systems and hardware
- data recovery tools and techniques
- data structures, file organization, data modeling techniques, and methods for data storage and retrieval
- enterprise systems administration methods and procedures
- enterprise systems installation and configuration procedures
- enterprise systems performance monitoring principles and methods
- enterprise systems quality assurance principles
- enterprise systems security methods and procedures
- functionality and operability of current operating environment
- general computer architecture (CPU, memory allocation, peripheral devices in order to perform basic technical support functions
- general programming logic
- generally accepted IT concepts, practices, methods, and principles
- IT systems development life cycle management concepts
- requirement analysis principles and methods
- software distribution tools and mechanisms
- systems testing and evaluation principles, methods, and tools

## DESIRABLE *Competencies*

### Ability to

#### Soft Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices
- provide guidance in order to determine hardware and operating system resource requirements for the larger and more complex systems within the organization
- provide technical direction/leadership of program or project work
- provide technical leadership on group projects
- represent the organization in interactions with other organizations

#### Business Skills

- evaluate and recommend adoption of new or enhanced approaches to delivering IT services

#### Technical Skills

- develop new theories, concepts, standards and methodologies in operating enterprise systems management and administration
- ensure optimal use of commercially available products
- evaluate proposals for the acquisition of enterprise products or services
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures
- provide advice and guidance on a wide range and variety of complex enterprise issues
- serve as master expert and consultant to executive management to direct the design, development and implementation of recommended technical solutions to achieve optimal enterprise system data communication capability across multiple platforms

### Knowledge of

#### Business Skills

- cost-benefit analysis principles and methods
- principles of organizational development and financial management and IT change management practices

#### Technical Skills

- capacity management principles, concepts and tools
- current trends for IT strategic planning, acquisition management policies and procedures
- Customized Off-the Shelf (COTS) enterprise products and components
- IT project management principles and methods
- management/measurement methods, tools, and techniques
- modeling and simulation tools and techniques
- new and emerging enterprise system technologies and/or industry trends
- optimization concepts and methods
- software design principles and methods
- software design theories and concepts
- system engineering concepts and methods



## ESSENTIAL *Competencies*

in addition to entry & journey level essential competencies

### Ability to

#### Soft Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices
- provide technical direction/leadership of program or project work
- provide technical leadership on group projects
- represent the organization in interactions with other organizations

#### Business Skills

- evaluate and recommend adoption of new or enhanced approaches to delivering IT services

#### Technical Skills

- develop new theories, concepts, standards and methodologies in operating enterprise systems management and administration
- ensure optimal use of commercially available products
- evaluate proposals for the acquisition of enterprise products or services
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures
- provide advice and guidance on a wide range and variety of complex enterprise issues
- provide guidance in order to determine hardware and operating system resource requirements for the larger and more complex systems within the organization
- serve as master expert and consultant to executive management to direct the design, development and implementation of recommended technical solutions to achieve optimal enterprise system data communication capability across multiple platforms

### Knowledge of

#### Business Skills

- cost-benefit analysis principles and methods
- principles of organizational development and financial management and IT change management practices

#### Technical Skills

- capacity management principles, concepts and tools
- current trends for IT strategic planning, acquisition management policies and procedures
- Customized Off-the Shelf (COTS) enterprise products and components
- IT project management principles and methods
- management/measurement methods, tools, and techniques
- modeling and simulation tools and techniques
- new and emerging enterprise system technologies and/or industry trends
- optimization concepts and methods
- software design principles and methods
- software design theories and concepts
- system engineering concepts and methods

## DESIRABLE *Competencies*

### Ability to

Refer to Entry and Journey Level Competencies

### Knowledge of

Refer to Entry and Journey Level Competencies

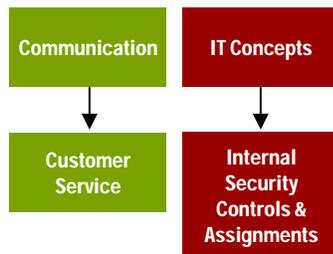
# Information Systems Security Administration

Incumbents in this functional area serve both internal and external clients by ensuring the security of information technology systems for State departments. Incumbents maintain the security of the off-the-shelf and State-developed applications installed on the State's information systems. The software and/or databases being secured may reside on a mainframe, mini computer or personal computer, be multi-user, multi-tasking and may consist of many interrelated programs spread across multiple platforms. Incumbents may, in addition to other duties, also oversee the authorization and monitoring of access to any part of the Department's facilities or infrastructure in accordance with established organization policy. Such requirements include the evaluation of information systems to identify residual risks, investigation of unauthorized access, and the performance of other administrative duties related to security management.

## CURRICULUM PATH

### ENTRY I

This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature. This level must be familiar with generally accepted IT concepts, practices, methods and principles.



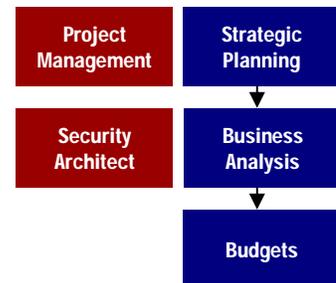
### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.



### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical application development needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.



#### LEGEND



Note: Competencies are progressive and are reflected at the earliest level.



# Information Systems **Security Administration**

## **ESSENTIAL** Competencies

### Ability to

No Essential Competencies Exist— Refer to Desirable Competencies

### Knowledge of

- oral and written communication techniques

## **DESIRABLE** Competencies

### Ability to

#### Soft Skills

- advise other IT experts throughout the department or in other departments on a variety of situations and issues that involve applying or adapting new security theories, concepts, principles, standards, methods, or practices
- provide advice and guidance in implementing IT security policies and procedures in the development and operation of network systems

#### Business Skills

- assist users in defining their needs for new access and privileges
- ensure coordination and/or collaboration on security activities
- relate requirements to user privileges by gaining knowledge of their business needs
- serve as senior expert and consultant to the executive management to advise on integrating security programs with other programs of equivalent scope and complexity

#### Technical Skills

- develop new theories, concepts, standards and methodologies in security administration
- develop, implement, and coordinate activities designed to ensure, protect, and restore IT systems, services, and capabilities
- ensure proper protection of evidence used in investigating computer crimes
- evaluate established IT security methods and procedures
- identify and resolve issues and problems in IT security
- identify and resolve potential security conflicts to minimize the adverse impact to system custodians and stakeholders caused by a breach of security
- implement and support IT security applications
- integrate information systems security with other security disciplines certify systems or network accreditation
- monitor and evaluate systems' compliance with IT security requirements
- operate and administer logical access controls relating to one or more platforms in order to provide a continuous and secure access service for the organization
- participate in defining IT security assignments
- perform routine and recurring assignments in the security administration area
- prepare and update manuals, instructions and operating procedures
- prepare recommendations for changes in methods and practices where appropriate
- provide information and assistance to customers
- provide technical direction/leadership of security program or project work
- select security design by using available resources

### Knowledge of

#### Business Skills

- client user, and business needs
- contingency plan for backup and recovery functions
- development and change management theories and their application in the IT environment
- IT security practices and methods (current and trends) for strategic planning
- legislation or external regulations which affect security within any defined scope of responsibility
- principles of organizational financial management

#### Technical Skills

- computer forensics principles
- encryption principles and techniques for application, integration, and administration of the organizational security program
- implementing security policies for clients
- IT concepts and practices
- IT analytical methods
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT security certification and accreditation requirements and processes
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- methods for evaluating, implementing, and disseminating IT security tools and procedures
- methods, techniques, and tools used for risk assessment and mitigation of risk to IT projects
- network operations and protocols
- security policy administration to effectively monitor security software
- security strategies to maintain the integrity of data
- security technology technical documentation methods and procedures
- state information systems security protocols
- systems analysis principles and methods
- total infrastructure protection environment
- various database applications to determine the level and type of security needed to protect the application



## ESSENTIAL Competencies

in addition to entry level essential competencies

### Ability to

#### Soft Skills

- provide advice and guidance in implementing IT security policies and procedures in the development and operation of network systems

#### Business Skills

- assist users in defining their needs for new access and privileges
- ensure coordination and/or collaboration on security activities
- relate requirements to user privileges by gaining knowledge of their business needs

#### Technical Skills

- develop, implement, and coordinate activities designed to ensure, protect, and restore IT systems, services, and capabilities
- ensure proper protection of evidence used in investigating computer crimes
- evaluate established IT security methods and procedures
- identify and resolve issues and problems in IT security
- identify and resolve potential security conflicts to minimize the adverse impact to system custodians and stakeholders caused by a breach of security
- implement and support IT security applications
- monitor and evaluate systems' compliance with IT security requirements
- operate and administer logical access controls relating to one or more platforms in order to provide a continuous and secure access service for the organization
- participate in defining IT security assignments
- perform routine and recurring assignments in the security administration area
- prepare and update manuals, instructions and operating procedures
- prepare recommendations for changes in methods and practices where appropriate
- provide information and assistance to customers
- select security design by using available resources

### Knowledge of

#### Soft Skills

- oral and written communication techniques

#### Business Skills

- client user, and business needs
- contingency plan for backup and recovery functions
- IT security practices and methods (current and trends) for strategic planning
- legislation or external regulations which affect security within any defined scope of responsibility
- security policy administration to effectively monitor security software

#### Technical Skills

- implementing security policies for clients
- IT concepts and practices
- IT analytical methods
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- methods for evaluating, implementing, and disseminating IT security tools and procedures
- methods, techniques, and tools used for risk assessment and mitigation of risk to IT projects
- network operations and protocols
- security strategies to maintain the integrity of data
- security technology technical documentation methods and procedures
- state information systems security protocols
- systems analysis principles and methods
- total infrastructure protection environment
- various database applications to determine the level and type of security needed to protect the application

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- advise other IT experts throughout the department or in other departments on a variety of situations and issues that involve applying or adapting new security theories, concepts, principles, standards, methods, or practices

#### Business Skills

- serve as senior expert and consultant to the executive management to advise on integrating security programs with other programs of equivalent scope and complexity

#### Technical Skills

- develop new theories, concepts, standards and methodologies in security administration
- integrate information systems security with other security disciplines certify systems or network accreditation
- provide technical direction/leadership of security program or project work

### Knowledge of

#### Business Skills

- development and change management theories and their application in the IT environment
- principles of organizational financial management

#### Technical Skills

- computer forensics principles
- encryption principles and techniques for application, integration, and administration of the organizational security program
- IT security certification and accreditation requirements and processes



## ESSENTIAL *Competencies*

in addition to entry & journey level essential competencies

### Ability to

#### Soft Skills

- advise other IT experts throughout the department or in other departments on a variety of situations and issues that involve applying or adapting new security theories, concepts, principles, standards, methods, or practices

#### Business Skills

- serve as senior expert and consultant to the executive management to advise on integrating security programs with other programs of equivalent scope and complexity

#### Technical Skills

- develop new theories, concepts, standards and methodologies in security administration
- integrate information systems security with other security disciplines certify systems or network accreditation
- provide technical direction/leadership of security program or project work

### Knowledge of

#### Business Skills

- development and change management theories and their application in the IT environment
- principles of organizational financial management

#### Technical Skills

- computer forensics principles
- encryption principles and techniques for application, integration, and administration of the organizational security program
- IT security certification and accreditation requirements and processes

## DESIRABLE **Competencies**

### Ability to

Refer to Entry and Journey Level Competencies

### Knowledge of

Refer to Entry and Journey Level Competencies

# IT Business Consultant

Incumbents in this functional area provide expertise and general consultation to both internal and external clients on a wide array of issues related to feasibility analysis, implementation, and evaluation of information technology solutions to business and administrative processes. Activities associated with the development of information technology business proposals include business requirement and process analysis; specification and evaluation of alternative information technology solutions; system design, testing, implementation, administration, and evaluation; state information technology administrative procedures, such as information technology project initiation and configuration management, information technology project management, procurement, budgeting, negotiation, and contract management.

## CURRICULUM PATH

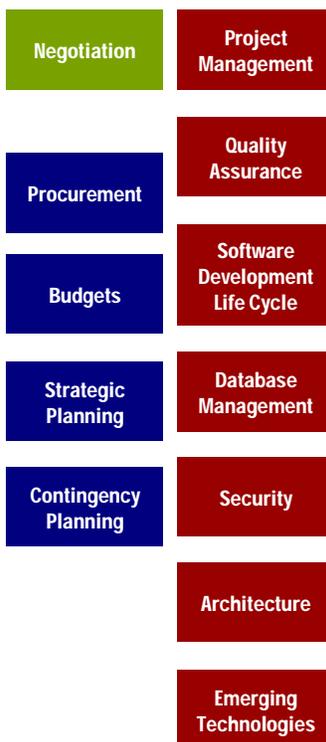
### ENTRY I

This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature. This level must be familiar with generally accepted IT concepts, practices, methods and principles.



### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.



### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical application development needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.

#### LEGEND



Note: Competencies are progressive and are reflected at the earliest level.



# IT Business Consultant

## ESSENTIAL Competencies

### Ability to

#### Soft Skills

- communicate factual and procedural information clearly, orally and in writing

#### Business Skills

- gather and analyze basic facts and draw conclusions

### Knowledge of

No Essential Competencies Exist— Refer to Desirable Competencies

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- negotiate IT contract revisions
- prepare and present reports
- provide advice and guidance on a wide range and variety of complex IT issues
- represent the organization in interactions with other organizations
- under guidance, write technical IT specifications
- work with customers to resolve IT technical and operational problems

#### Business Skills

- apply and monitor implementation of information systems to meet applicable requirements
- assist in the preparation of IT RFPs and respond to IT proposals
- conduct analyses and recommend resolution of complex issues affecting the specialty area
- coordinate and consult with system hardware and software vendors
- define and utilize IT contract penalties
- determine potential impacts of identified IT risks
- establish and communicate IT project goals and objectives
- evaluate and categorize IT project risks
- evaluate IT proposals and select vendors
- evaluate proposals for the acquisition of IT products or services
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- identify and specify business requirements for new or enhanced systems and develop basic system specifications
- interpret IT policies standards, and guidelines
- learn the missions and programs of customer organizations
- negotiate terms of IT vendor contracts
- participate collaboratively in the development of an information systems strategy to support an organization's business goals, and the planning of the implementation of that strategy
- prepare, justify, and/or administer an organizational IT budget

### Ability to

#### Technical Skills

- administer IT task schedules
- apply emerging technologies to business processes
- coordinate multiple IT projects
- demonstrate an advanced level of administrative and technical knowledge, along with the leadership ability required to allow administration of the largest and most complex IT solutions throughout the entire developmental life cycle
- develop IT tactical plans to meet business enterprise goals and objectives
- ensure optimal use of commercially available products
- estimate and plan IT project timelines and milestones
- manage change and its effects on IT project resources
- manage problems that arise in the course of IT projects
- match individuals to IT job projects
- monitor and evaluate the progress and outcomes of IT operational plans
- monitor IT progress according to plan
- monitor IT vendor performance to contract (such as analyze Statement of Work, define success criteria, and test product/system deliverables)
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures
- provide technical direction/leadership of program or project work
- provide technical leadership on group projects
- test and optimize the functionality of systems, networks and data
- to serve as consultant and subject matter expert to executive management and outside agencies on a wide range of issues pertaining to IT planning, policy analysis and articulation, and project implementation and administration

<Entry Level Continued On Next Page >



# IT Business Consultant

< Entry Level Continued From Previous Page >

## DESIRABLE Competencies

### Knowledge of

#### Soft Skills

- IT technical documentation methods and procedures

#### Business Skills

- acquisition management policies and procedures
- application of IT to support business goals and objectives and principles of organizational financial management as it relates to IT project management
- contracting methods, requirements, and procedures for IT acquisitions
- cost-benefit analysis principles and methods
- current trends for IT strategic planning
- methods and practices to prepare the IT organization to meet the business needs for service delivery
- methods for researching and analyzing external IT products and services to determine their potential for meeting organizational standards and business needs.
- methods, metrics, tools and techniques of IT Business Process Reengineering (such as relational data modeling, functional business models, and process modeling)
- methods, techniques, and tools used for risk assessment and mitigation of risk to IT projects
- requirement analysis principles and methods

#### Technical Skills

- basics of operating systems and hardware, client side support and server side support
- Customized Off-the-Shelf (COTS) products and components
- database management principles and methods
- IT principles and practices systems analysis principles and methods
- IT performance monitoring principles and methods
- IT principles, methods, techniques and tools for the effective management of projects from initiation through to implementation (such as IT project initiation and planning, work breakdown schedules for IT projects, IT project schedule development, critical path analysis, project direction & control, earned value analysis, project close-out activities & post-implementation close-out activities)
- IT quality assurance principles
- IT systems security methods and procedures
- IT test management techniques including principles, methods and tools for the effective coordination of the testing process and execution of tests through the lifecycle of development plans
- new and emerging IT and/or industry trends
- performance management/measurement methods, tools and techniques
- principles of organizational development and IT change management practices



# IT Business Consultant

## **ESSENTIAL** Competencies

in addition to entry level essential competencies

### Ability to

#### Soft Skills

- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- prepare and present reports
- provide advice and guidance on a wide range and variety of complex IT issues
- represent the organization in interactions with other organizations
- under guidance, write technical IT specifications
- work with customers to resolve IT technical and operational problems

#### Business Skills

- apply and monitor implementation of information systems to meet applicable requirements
- assist in the preparation of IT RFPs and respond to IT proposals
- conduct analyses and recommend resolution of complex issues affecting the specialty area
- coordinate and consult with system hardware and software vendors
- determine potential impacts of identified IT risks
- establish and communicate IT project goals and objectives
- evaluate and categorize IT project risks
- evaluate IT proposals and select vendors
- evaluate proposals for the acquisition of IT products or services
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- identify and specify business requirements for new or enhanced systems and develop basic system specifications
- interpret IT policies standards, and guidelines
- learn the missions and programs of customer organizations
- participate collaboratively in the development of an information systems strategy to support an organization's business goals, and the planning of the implementation of that strategy

#### Technical Skills

- administer IT task schedules
- apply emerging technologies to business processes
- develop IT tactical plans to meet business enterprise goals and objectives
- ensure optimal use of commercially available products
- estimate and plan IT project timelines and milestones
- manage change and its effects on IT project resources
- manage problems that arise in the course of IT projects
- monitor and evaluate the progress and outcomes of IT operational plans
- monitor IT progress according to plan
- monitor IT vendor performance to contract (such as analyze Statement of Work, define success criteria, and test product/system deliverables)
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures
- provide technical leadership on group projects
- test and optimize the functionality of systems, networks and data

### Knowledge of

#### Soft Skills

- IT technical documentation methods and procedures

#### Business Skills

- acquisition management policies and procedures
- application of IT to support business goals and objectives and principles of organizational financial management as it relates to IT project management
- contracting methods, requirements, and procedures for IT acquisitions
- cost-benefit analysis principles and methods
- current trends for IT strategic planning
- methods and practices to prepare the IT organization to meet the business needs for service delivery
- methods for researching and analyzing external IT products and services to determine their potential for meeting organizational standards and business needs.
- methods, metrics, tools and techniques of IT Business Process Reengineering (such as relational data modeling, functional business models, and process modeling)
- methods, techniques, and tools used for risk assessment and mitigation of risk to IT projects
- requirement analysis principles and methods

#### Technical Skills

- database management principles and methods
- IT principles and practices systems analysis principles and methods
- IT principles, methods, techniques and tools for the effective management of projects from initiation through to implementation (such as IT project initiation and planning, work breakdown schedules for IT projects, IT project schedule development, critical path analysis, project direction & control, earned value analysis, project close-out activities & post-implementation close-out activities)
- IT quality assurance principles
- IT test management techniques including principles, methods and tools for the effective coordination of the testing process and execution of tests through the lifecycle of development plans
- new and emerging IT and/or industry trends
- performance management/measurement methods, tools and techniques
- principles of organizational development and IT change management practices

<Journey Level Continued On Next Page >



# IT Business Consultant

< Journey Level Continued From Previous Page >

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- negotiate IT contract revisions

#### Business Skills

- define and utilize IT contract penalties
- negotiate terms of IT vendor contracts
- prepare, justify, and/or administer an organizational IT budget

#### Technical Skills

- coordinate multiple IT projects
- demonstrate an advanced level of administrative and technical knowledge, along with the leadership ability required to allow administration of the largest and most complex IT solutions throughout the entire developmental life cycle
- match individuals to IT job projects
- provide technical direction/leadership of program or project work
- to serve as consultant and subject matter expert to executive management and outside agencies on a wide range of issues pertaining to IT planning, policy analysis and articulation, and project implementation and administration

### Knowledge of

#### Technical Skills

- basics of operating systems and hardware, client side support and server side support
- Customized Off-the-Shelf (COTS) products and components
- IT performance monitoring principles and methods
- IT systems security methods and procedures



# IT Business Consultant

## **ESSENTIAL** *Competencies*

in addition to entry & journey level essential competencies

### Ability to

#### Soft Skills

- negotiate IT contract revisions

#### Business Skills

- define and utilize IT contract penalties
- negotiate terms of IT vendor contracts
- prepare, justify, and/or administer an organizational IT budget

#### Technical Skills

- coordinate multiple IT projects
- demonstrate an advanced level of administrative and technical knowledge, along with the leadership ability required to allow administration of the largest and most complex IT solutions throughout the entire developmental life cycle
- match individuals to IT job projects
- provide technical direction/leadership of program or project work
- to serve as consultant and subject matter expert to executive management and outside agencies on a wide range of issues pertaining to IT planning, policy analysis and articulation, and project implementation and administration

### Knowledge of

#### Technical Skills

- basics of operating systems and hardware, client side support and server side support
- Customized Off-the-Shelf (COTS) products and components
- IT performance monitoring principles and methods
- IT systems security methods and procedures

## **DESIRABLE** **Competencies**

### Ability to

Refer to Entry and Journey Level Competencies

### Knowledge of

Refer to Entry and Journey Level Competencies

# IT Project Manager

Incumbents in this functional area provide expertise to both internal and external clients on a wide array of issues related to feasibility analysis, implementation, and evaluation of information technology solutions to business and administrative processes. Activities associated with the development of information technology business projects include analysis of projects for cost, time, scope, risk and quality using skills and knowledge of project initiation and configuration management, information technology project management, procurement, budgeting, negotiation, and contract management. Utilizing the control elements common to all projects managed for maximum results. Applying quality management methods to effectively organize staff and lead a successful project team.

## CURRICULUM PATH

### ENTRY I

This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature. This level must be familiar with generally accepted IT concepts, practices, methods and principles.



### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.



### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical application development needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.



#### LEGEND



Note: Competencies are progressive and are reflected at the earliest level.



# IT Project Manager\*

## ESSENTIAL Competencies

### Ability to

#### Soft Skills

- communicate factual and procedural information clearly, orally and in writing

#### Technical Skills

- identify a need for and know where or how to gather information

### Knowledge of

No Essential Competencies Exist— Refer to Desirable Competencies

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- assess financial condition of an organization
- coordinate with other organizations or parts of the organization to accomplish goals
- organize work, set priorities, and determine resource requirements, determine short or long-term goals and strategies to achieve them
- plan, administer and monitor expenditures to ensure cost-effective support of program and policies
- prepare and present reports
- prepare, justify, and/or administer the budget for program areas
- provide advice and guidance on a wide range and variety of complex IT issues
- represent the organization in interactions with other organizations
- work with customers to resolve IT technical and operational problems

#### Business Skills

- assist in the preparation of IT RFPs and respond to IT proposals
- define and utilize IT contract penalties
- establish and communicate IT project goals and objectives
- evaluate IT proposals and select vendors
- interpret IT policies standards, and guidelines
- learn the missions and programs of customer organizations
- participate collaboratively in the development of an information systems strategy to support an organization's business goals, and the planning of the implementation of that strategy

#### Technical Skills

- administer IT task schedules
- coordinate multiple IT projects
- develop IT tactical plans to meet business enterprise goals and objectives
- estimate and plan IT project timelines and milestones
- manage change and its effects on IT project resources
- manage problems that arise in the course of IT projects
- match individuals to IT job projects
- monitor and evaluate the progress and outcomes of IT operational plans
- monitor IT vendor performance to contract (such as analyze Statement of Work, define success criteria, and test product/system deliverables)
- monitor progress and evaluate outcomes
- organize and maintain information or information management systems
- provide technical direction/leadership of program or project work

<Entry Level Continued On Next Page >

\* Includes relevant IT Business Consultant competencies based on similarities in functional areas.



# IT Project Manager\*

< Entry Level Continued From Previous Page >

## DESIRABLE Competencies

### Knowledge of

#### Business Skills

- application of IT to support business goals and objectives and principles of organizational financial management as it relates to IT project management
- methods and practices to prepare the IT organization to meet the business needs for service delivery
- methods and tools used for risk assessment and mitigation of risk
- methods, metrics, tools, and techniques of Business Process Reengineering
- principles and methods of capital investment analysis or business case analysis, including return on investment analysis
- principles and methods to identify, analyze, specify, design, and manage functional and infrastructure requirements
- principles, methods, and tools (for example, surveys, system performance measures) to assess the effectiveness and practicality of IT systems
- various types of contracts, techniques for contracting or procurement, and contract negotiation and administration

### Knowledge of

#### Technical Skills

- architectural methodologies used in the design and development of information systems, including the physical structure of a system's internal operations and interactions with other systems
- architecture and typology of software, hardware, and networks, including LANS, WANS, and telecommunications systems, their components and associated protocols and standards, and how they operate and integrate with one another
- developments and new applications of IT (hardware, software, telecommunications), emerging technologies and their applications to business processes, and applications and implementation of information systems to meet organizational requirements
- IT performance monitoring principles and methods
- IT principles, methods, techniques and tools for the effective management of projects from initiation through to implementation (such as IT project initiation and planning, work breakdown schedules for IT projects, IT project schedule development
- methods, tools, and procedures, including development of information security plans, to prevent information system vulnerabilities, and provide or restore security of information systems and network services
- principles and methods for planning or managing the implementation, update, or integration of information system components
- principles, methods, and procedures for installing, integrating, and optimizing information system components
- principles, methods, and techniques of IT assessment, planning, management, monitoring, and evaluation, such as IT baseline assessment, interagency functional analysis, contingency planning, and disaster recovery
- principles, methods, and tools of quality assurance and quality control used to ensure a product fulfills functional requirements and standards
- principles, methods, or tools for developing, scheduling, coordinating, and managing projects and resources, including monitoring and inspecting costs, work, and contractor performance
- principles of organizational development and IT change management practices
- principles, procedures, and tools of data management, such as modeling techniques, data backup, data recovery, data dictionaries, data warehousing, data mining, data disposal, and data standardization processes
- systems life cycle management concepts used to plan, develop, implement, operate, and maintain information systems
- the principles and methods of cost-benefit analysis, including the time value of money, present value concepts, and quantifying tangible and intangible benefits
- translating functional requirements into technical requirements used for logical design or presenting alternative technologies or approaches

\* Includes relevant IT Business Consultant competencies based on similarities in functional areas.



# IT Project Manager\*

## ESSENTIAL Competencies

in addition to entry level essential competencies

### Ability to

#### Soft Skills

- prepare and present reports
- provide advice and guidance on a wide range and variety of complex IT issues
- represent the organization in interactions with other organizations
- work with customers to resolve IT technical and operational problems

#### Business Skills

- assist in the preparation of IT RFPs and respond to IT proposals
- coordinate with other organizations or parts of the organization to accomplish goals
- establish and communicate IT project goals and objectives
- evaluate IT proposals and select vendors
- interpret IT policies standards, and guidelines
- learn the missions and programs of customer organizations
- organize work, set priorities, and determine resource requirements, determine short or long term goals and strategies to achieve them
- participate collaboratively in the development of an information systems strategy to support an organization's business goals, and the planning of the implementation of that strategy
- plan, administer and monitor expenditures to ensure cost-effective support of program and policies

#### Technical Skills

- administer IT task schedules
- develop IT tactical plans to meet business enterprise goals and objectives
- estimate and plan IT project timelines and milestones
- manage change and its effects on IT project resources
- manage problems that arise in the course of IT projects
- monitor and evaluate the progress and outcomes of IT operational plans
- monitor IT progress according to plan
- monitor IT vendor performance to contract (such as analyze Statement of Work, define success criteria, and test product/system deliverables)
- monitor progress and evaluate outcomes
- organize and maintain information or information management systems
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures

### Knowledge of

#### Business Skills

- application of IT to support business goals and objectives and principles of organizational financial management as it relates to IT project management
- methods and practices to prepare the IT organization to meet the business needs for service delivery
- methods and tools used for risk assessment and mitigation of risk
- methods, metrics, tools, and techniques of Business Process Reengineering
- principles and methods to identify, analyze, specify, design, and manage functional and infrastructure requirements
- principles, methods, and tools (for example, surveys, system performance measures) to assess the effectiveness and practicality of IT systems
- various types of contracts, techniques for contracting or procurement, and contract negotiation and administration

#### Technical Skills

- architecture and typology of software, hardware, and networks, including LANS, WANS, and telecommunications systems, their components and associated protocols and standards, and how they operate and integrate with one another
- IT principles, methods, techniques and tools for the effective management of projects from initiation through to implementation (such as IT project initiation and planning, work breakdown schedules for IT projects, IT project schedule develop
- principles and methods for planning or managing the implementation, update, or integration of information system components
- principles, methods, and procedures for installing, integrating, and optimizing information system components
- principles, methods, and techniques of IT assessment, planning, management, monitoring, and evaluation, such as IT baseline assessment, interagency functional analysis, contingency planning, and disaster recovery
- principles, methods, and tools of quality assurance and quality control used to ensure a product fulfills functional requirements and standards
- principles, methods, or tools for developing, scheduling, coordinating, and managing projects and resources, including monitoring and inspecting costs, work, and contractor performance
- principles of organizational development and IT change management practices
- systems life cycle management concepts used to plan, develop, implement, operate, and maintain information systems
- the principles and methods of cost-benefit analysis, including the time value of money, present value concepts, and quantifying tangible and intangible benefits
- translating functional requirements into technical requirements used for logical design or presenting alternative technologies or approaches

<Journey Level Continued On Next Page >

\* Includes relevant IT Business Consultant competencies based on similarities in functional areas.



# IT Project Manager\*

< Journey Level Continued From Previous Page >

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- negotiate IT contract revisions

#### Business Skills

- assess financial condition of an organization
- define and utilize IT contract penalties
- negotiate terms of IT vendor contracts
- prepare, justify, and/or administer the budget for program areas

#### Technical Skills

- coordinate multiple IT projects
- match individuals to IT job projects
- provide technical direction/leadership of program or project work

### Knowledge of

#### Business Skills

- principles and methods of capital investment analysis or business case analysis, including return on investment analysis

#### Technical Skills

- architectural methodologies used in the design and development of information systems, including the physical structure of a system's internal operations and interactions with other systems
- developments and new applications of IT (hardware, software, telecommunications), emerging technologies and their applications to business processes, and applications and implementation of information systems to meet organizational requirements
- IT performance monitoring principles and methods
- methods, tools, and procedures, including development of information security plans, to prevent information system vulnerabilities, and provide or restore security of information systems and network services
- principles, procedures, and tools of data management, such as modeling techniques, data backup, data recovery, data dictionaries, data warehousing, data mining, data disposal, and data standardization processes

\* Includes relevant IT Business Consultant competencies based on similarities in functional areas.



# IT Project Manager\*

## ESSENTIAL Competencies

in addition to entry & journey level essential competencies

### Ability to

#### Soft Skills

- negotiate IT contract revisions

#### Business Skills

- assess financial condition of an organization
- define and utilize IT contract penalties
- negotiate terms of IT vendor contracts
- prepare, justify, and/or administer the budget for program areas

#### Technical Skills

- coordinate multiple IT projects
- match individuals to IT job projects

### Knowledge of

#### Business Skills

- principles and methods of capital investment analysis or business case analysis, including return on investment analysis

#### Technical Skills

- architecture and typology of software, hardware, and networks, including LANS, WANS, and telecommunications systems, their components and associated protocols and standards, and how they operate and integrate with one another
- developments and new applications of IT (hardware, software, telecommunications), emerging technologies and their applications to business processes, and applications and implementation of information systems to meet organizational requirements
- IT performance monitoring principles and methods
- methods, tools, and procedures, including development of information security plans, to prevent information system vulnerabilities, and provide or restore security of information systems and network services
- principles, procedures, and tools of data management, such as modeling techniques, data backup, data recovery, data dictionaries, data warehousing, data mining, data disposal, and data standardization processes

## DESIRABLE Competencies

### Ability to

Refer to Entry and Journey Level Competencies

### Knowledge of

Refer to Entry and Journey Level Competencies

\* Includes relevant IT Business Consultant competencies based on similarities in functional areas.

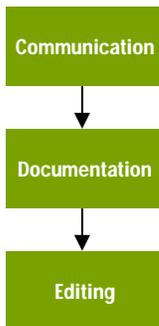
# IT Technical Document Writer

Incumbents in this functional area serve both internal and external clients and are responsible to create technical manuals, which may include detailed specifications, online help, web content and training materials. The technical documents will be created for systems applications, which may vary in size, platform, or complexity. Incumbents will define the audience and purpose of the document; determine the technical level, tone, and organizational need. Incumbents will also conduct interviews with users and technical experts for input; create the document and design graphics; and choose the document's delivery method.

## CURRICULUM PATH

### ENTRY I

This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature. This level must be familiar with generally accepted IT concepts, practices, methods and principles.



### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.

### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical application development needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.



#### LEGEND



Note: Competencies are progressive and are reflected at the earliest level.



# IT Technical Document Writer

## ESSENTIAL Competencies

### Ability to

#### Soft Skills

- determine requirements for information systems documentation changes
- develop and deliver well-written basic procedural or documentation material
- edit written material from users and verify accuracy
- respond to questions covering basic systems writing

### Knowledge of

#### Soft Skills

- documentation standards, interview techniques with respect to customer requirements and delivery options
- IT technical documentation methods and procedures
- oral and written communication techniques
- technical writing tools, methods and delivery options

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- analyze and determine a range of resource material requirements
- assist in the review and/or development of new products related to technical documentation
- conduct analyses and recommend resolution of complex issues affecting the specialty area
- deliver well-written complex documentation
- design information for on-line help facilities and exhibits
- design, prepare and write communication and audio-visual manual
- develop and coordinate design and construction of resource products
- edit information products and resources materials
- ensure optimal use of commercially available technical writing products
- ensure proper identification and dissemination of resource material
- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- interpret IT policies, standards, and guidelines
- learn the missions and programs of customer organizations
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures
- prepare and present reports
- provide advice and guidance on a wide range and variety of complex IT issues
- provide technical leadership on group technical writing projects
- represent the organization in interactions with other organizations
- write modules documenting requirements, procedures, policies

#### Business Skills

- coordinate production of time dated resources
- coordinate staff information and provide update meetings
- develop cost estimate and budget requirements
- establish organization's priorities for development
- evaluate proposals for the acquisition of IT products or services
- provide technical direction/leadership of program or project work, specifically coordinate the work of technical writers and assume responsibility for their activities

#### Technical Skills

- ensure adherence to the organization's procedures and standards
- ensure consistency of functions across platforms, systems, and projects
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- test and optimize the functionality of systems, networks, and data
- test quality, effectiveness and accuracy of new resource products

### Knowledge of

#### Soft Skills

- copyright issues and laws related to technical documentation
- group interview facilitation techniques for IT subject matter
- multiple documentation tools, techniques and delivery mechanisms to set documentation standards for the organization

#### Business Skills

- acquisition management policies and procedures
- principles of organizational development and financial management and IT change management practices

#### Technical Skills

- basics of operating systems and hardware, client side support and server side support
- cost-benefit analysis principles and methods
- current trends for IT strategic planning
- Customized Off-The Shelf (COTS) products and components
- database management principles and methods
- generally accepted IT concepts, practices, methods, and principles
- industry standards
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT project management principles and methods
- new and emerging information technologies and/or industry trends
- performance management/measurement methods, tools, and techniques
- requirement analysis principles and methods
- research methods
- systems testing and evaluation principles, methods, and tools



## ESSENTIAL Competencies

in addition to entry level essential competencies

### Ability to

#### Soft Skills

- analyze and determine a range of resource material requirements
- assist in the review and/or development of new products related to technical documentation
- conduct analyses and recommend resolution of complex issues affecting the specialty area
- deliver well-written complex documentation
- design information for on-line help facilities and exhibits
- design, prepare and write communication and audio-visual manual
- develop and coordinate design and construction of resource products
- edit information products and resources materials
- ensure optimal use of commercially available technical writing products
- ensure proper identification and dissemination of resource material
- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- interpret IT policies, standards, and guidelines
- learn the missions and programs of customer organizations
- plan and carry out difficult and complex assignments and develop new methods, approaches, and procedures
- prepare and present reports
- provide technical leadership on group technical writing projects
- represent the organization in interactions with other organizations
- write modules documenting requirements, procedures, policies

#### Business Skills

- develop cost estimate and budget requirements

#### Technical Skills

- ensure adherence to the organization's procedures and standards
- ensure consistency of functions across platforms, systems, and projects
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks

### Knowledge of

#### Soft Skills

- copyright issues and laws related to technical documentation
- group interview facilitation techniques for IT subject matter
- multiple documentation tools, techniques and delivery mechanisms to set documentation standards for the organization

#### Technical Skills

- Customized Off-The Shelf (COTS) products and components
- generally accepted IT concepts, practices, methods, and principles
- industry standards
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT project management principles and methods
- requirement analysis principles and methods
- research methods

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- provide advice and guidance on a wide range and variety of complex IT issues

#### Business Skills

- coordinate production of time dated resources
- coordinate staff information and provide update meetings
- establish organization's priorities for development
- evaluate proposals for the acquisition of IT products or services
- provide technical direction/leadership of program or project work, specifically coordinate the work of technical writers and assume responsibility for their activities

#### Technical Skills

- test and optimize the functionality of systems, networks, and data
- test quality, effectiveness and accuracy of new resource products

### Knowledge of

#### Business Skills

- acquisition management policies and procedures
- principles of organizational development and financial management and IT change management practices

#### Technical Skills

- basics of operating systems and hardware, client side support and server side support
- cost-benefit analysis principles and methods
- current trends for IT strategic planning
- database management principles and methods
- new and emerging information technologies and/or industry trends
- performance management/measurement methods, tools, and techniques
- systems testing and evaluation principles, methods, and tools



# IT Technical Document Writer

## ESSENTIAL Competencies

in addition to entry & journey level essential competencies

### Ability to

#### Soft Skills

- provide advice and guidance on a wide range and variety of complex IT issues

#### Business Skills

- evaluate proposals for the acquisition of IT products or services
- coordinate production of time dated resources
- coordinate staff information and provide update meetings
- establish organization's priorities for development
- provide technical direction/leadership of program or project work, specifically coordinate the work of technical writers and assume responsibility for their activities

#### Technical Skills

- test and optimize the functionality of systems, networks, and data
- test quality, effectiveness and accuracy of new resource products

### Knowledge of

#### Business Skills

- acquisition management policies and procedures
- principles of organizational development and financial management and IT change management practices

#### Technical Skills

- systems testing and evaluation principles, methods, and tools
- basics of operating systems and hardware, client side support and server side support
- cost-benefit analysis principles and methods
- current trends for IT strategic planning
- database management principles and methods
- new and emerging information technologies and/or industry trends
- performance management/measurement methods, tools, and techniques

## DESIRABLE Competencies

### Ability to

Refer to Entry and Journey Level Competencies

### Knowledge of

Refer to Entry and Journey Level Competencies

# Network/Client Server Administration

Incumbents in this functional area address interoperability issues related to hardware, software, and connectivity of communications such as cable, fiber optics and/or wireless communications. They may be responsible to manage information technology networks such as local area networks (LAN), Wide area networks (WAN), Intranets, Internets, and Extranets. In addition, incumbents may specialize in areas such as Client Server Administration, Network Administration, Systems Network Architecture (SNA), Internal Network Infrastructure, Network Performance, Network Operational and Disaster Recovery, Mainframe TCP/IP, Multi-protocol wide-area networking, Network Security; Firewalls, Network Management, and Virtual Private Networking (VPN). At the more advanced levels incumbents develop and administer policies and procedures (including network services) that ensure the department takes full advantage of network technologies to enhance the delivery of services in support of mission requirements. They also lead feasibility studies of new network technology teams, participate in strategic planning activities, contribute to network architecture and topology development, and act as consultants to other information technology personnel in leading an enterprise-level network project, such as establishing connectivity for new mission requirements or new customer organizations or accommodating changes in legislation.

## CURRICULUM PATH

### ENTRY I

This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature. This level must be familiar with generally accepted IT concepts, practices, methods and principles.

Analytical Skills

Communication

Networking Concepts

### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.

Organizational Business Processes

Network Administration

Network Management

Network Design & Engineering

### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical application development needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.

Leadership

Architecting Business Solutions

Project Management

### LEGEND

Soft Skills

Business Skills

Technical Skills

Note: Competencies are progressive and are reflected at the earliest level.



# Network/Client Server Administration

## ESSENTIAL Competencies

### Ability to

#### Soft Skills

- communicate factual and procedural information clearly, orally and in writing
- gather and analyze basic facts and draw conclusions

### Knowledge of

#### Technical Skills

- basic IT principles and practices

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- prepare and present reports
- provide technical direction/leadership of program or project work
- provide technical leadership on group projects
- represent the organization in interactions with other organizations

#### Business Skills

- provide/coordinate user support and training in the use of software and hardware
- provide network services that support business requirements
- learn the mission and programs of customer organizations
- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks

#### Technical Skills

- act as network architect on development of extremely complex statewide network systems involving multiple local area or wide area networks with departmental host system interfaces requiring the use of network and systems management tools
- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices
- analyze information to identify problems in the network and/or client server environment
- analyze operational problems
- assist in the development, configuration, installation, and maintenance of networked systems including local area networks (LANs) and wide area networks (WANs)
- conduct analysis and recommend resolution of complex issues affecting the specialty area

### Ability to

#### Technical Skills

- develop new theories, concepts, standards and methodologies in network architecture and topology
- efficiently apply available resources
- ensure optimal use of commercially available products
- evaluate proposals for the acquisition of network products or services
- follow procedures for a network system-wide audit
- following test plan and use test tools
- implement new applications
- interpret network policies, standards, and guidelines
- maintain network/client server system security and firewalls
- perform highly structured, entry-level work designed to develop broader and more in depth knowledge and skill needed to perform higher level network services assignments
- perform network/client server backups and recoveries
- perform routine network configuration management functions
- plan and carry out difficult and complex assignments and develop new methods, approaches and procedures
- plan, design, develop, and integrate network systems consistent with existing or planned network infrastructures
- plan, design, develop, manage, and enhance highly efficient network systems that respond to the organization's business requirements
- provide advice and guidance on a wide range and variety of complex network issues
- resolve compatibility issues
- serve as master expert and consultant to executive management in the capacity of network architect
- set up and maintain user accounts
- test and optimize the functionality of systems, networks, and data
- understand user applications and related user needs to configuration
- use network, telecommunication, client server monitoring tools, procedures and technique

<Entry Level Continued On Next Page >



# Network/Client Server Administration

< Entry Level Continued From Previous Page >

## DESIRABLE Competencies

### Knowledge of

#### Business Skills

- acquisition management policies and procedures
- IT change management practices
- IT project management principles and methods
- the organization's network architecture and available resources
- the organizations network architecture and infrastructure
- the organization's network architecture, topology, and protocols

### Knowledge of

#### Technical Skills

- basics of operating systems and hardware, client side support and server side support
- capabilities and applications of network equipment including hubs, routers, switches, bridges, servers, transmission media, and related hardware
- commercial off the shelf software (COTS) products and components
- cost-benefit analysis principles, methods, and practices
- current trends for IT strategic planning
- data conversion issues and procedures
- database management principles and methods as used on the Internet
- generally accepted IT concepts, practices, methods, and principles
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- local area and wide area network principles and concepts including bandwidth management
- network architecture and topology, including transmission protocols, broadcasting, switching, control, and management
- network compatibility issues and resolution procedures
- network design review procedures and process
- network standards, protocols and procedures
- network systems design, development, testing, installation, operations, management, and maintenance concepts and methods
- network systems management methods including end-to-end systems performance monitoring
- network test plan procedures and network testing tools
- new and emerging network technologies and/or industry trends
- performance management/measurement methods, tools, and techniques
- principles of organizational development
- principles of organizational financial management
- requirement analysis principles and methods
- security principles and methods
- systems testing and evaluation principles, methods, and tools
- workstation software loading and configuration procedures



# Network/Client Server Administration

## **ESSENTIAL** Competencies

in addition to entry level essential competencies

### Ability to

#### Soft Skills

- prepare and present reports
- provide technical direction/leadership of program or project work
- provide technical leadership on group projects
- represent the organization in interactions with other organizations

#### Business Skills

- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- learn the mission and programs of customer organizations
- provide network services that support business requirements
- provide/coordinate user support and training in the use of software and hardware

#### Technical Skills

- analyze information to identify problems in the network and/or client server environment
- analyze operational problems
- assist in the development, configuration, installation, and maintenance of networked systems including local area networks (LANs) and wide area networks (WANs)
- conduct analysis and recommend resolution of complex issues affecting the specialty area
- efficiently apply available resources
- ensure optimal use of commercially available products
- evaluate proposals for the acquisition of network products or services
- follow procedures for a network system-wide audit
- following test plan and use test tools
- implement new applications
- interpret network policies, standards, and guidelines
- maintain network/client server system security and firewalls
- perform highly structured, entry-level work designed to develop broader and more in depth knowledge and skill needed to perform higher level network services assignments
- perform network/client server backups and recoveries
- perform routine network configuration management functions
- plan and carry out difficult and complex assignments and develop new methods, approaches and procedures
- plan, design, develop, and integrate network systems consistent with existing or planned network infrastructures
- plan, design, develop, manage, and enhance highly efficient network systems that respond to the organization's business requirements
- provide advice and guidance on a wide range and variety of complex network issues
- resolve compatibility issues
- set up and maintain user accounts
- test and optimize the functionality of systems, networks, and data
- understand user applications and related user needs to configuration
- use network, telecommunication, client server monitoring tools, procedures and technique

### Knowledge of

#### Business Skills

- IT change management practices
- IT project management principles and methods
- the organizations network architecture and infrastructure
- the organization's network architecture, topology, and protocols

#### Technical Skills

- basics of operating systems and hardware, client side support and server side support
- capabilities and applications of network equipment including hubs, routers, switches, bridges, servers, transmission media, and related hardware
- commercial off the shelf software (COTS) products and components
- data conversion issues and procedures
- generally accepted IT concepts, practices, methods, and principles
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- local area and wide area network principles and concepts including bandwidth management
- network architecture and topology, including transmission protocols, broadcasting, switching, control, and management
- network compatibility issues and resolution procedures
- network design review procedures and process
- network standards, protocols and procedures
- network systems design, development, testing, installation, operations, management, and maintenance concepts and methods
- network systems management methods including end-to-end systems performance monitoring
- network test plan procedures and network testing tools
- new and emerging network technologies and/or industry trends
- performance management/measurement methods, tools, and techniques
- requirement analysis principles and methods
- security principles and methods
- systems testing and evaluation principles, methods, and tools
- the organization's network architecture and available resources
- workstation software loading and configuration procedures

<Journey Level Continued On Next Page >



# Network/Client Server Administration

< Journey Level Continued From Previous Page >

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices

#### Technical Skills

- act as network architect on development of extremely complex statewide network systems involving multiple local area or wide area networks with departmental host system interfaces requiring the use of network and systems management tools
- develop new theories, concepts, standards and methodologies in network architecture and topology
- serve as master expert and consultant to executive management in the capacity of network architect

### Knowledge of

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles, methods, and practices
- principles of organizational financial management

#### Technical Skills

- current trends for IT strategic planning
- database management principles and methods as used on the Internet
- principles of organizational development



# Network/Client Server Administration

## **ESSENTIAL** *Competencies*

in addition to entry & journey level essential competencies

### Ability to

#### Soft Skills

- advise other IT experts throughout the organization or in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices

#### Technical Skills

- act as network architect on development of extremely complex statewide network systems involving multiple local area or wide area networks with departmental host system interfaces requiring the use of network and systems management tools
- develop new theories, concepts, standards and methodologies in network architecture and topology
- serve as master expert and consultant to executive management in the capacity of network architect

### Knowledge of

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles, methods, and practices
- principles of organizational development

#### Technical Skills

- current trends for IT strategic planning
- database management principles and methods as used on the Internet
- principles of organizational financial management
- workstation software loading and configuration procedures

## **DESIRABLE** *Competencies*

### Ability to

Refer to Entry and Journey Level Competencies

### Knowledge of

Refer to Entry and Journey Level Competencies

# Web / *Internet* Development

Incumbents in this functional area perform content and technical analysis, develop web applications, implement application/site design, maintain applications, and manage the enterprise web environment. Incumbents apply technical knowledge of Internet systems, services, and technologies to support Internet, intranet, and extranet content, format and information flow. At the more advanced levels, incumbents develop and administer policies and procedures (including security) that promote the management of Internet resources as a key asset. They also support development teams, participate in strategic planning activities, contribute to architectural development, and act as consultants to other information technology personnel in solving complex enterprise web environment system problems and business re-engineering efforts.

## CURRICULUM PATH

### ENTRY I

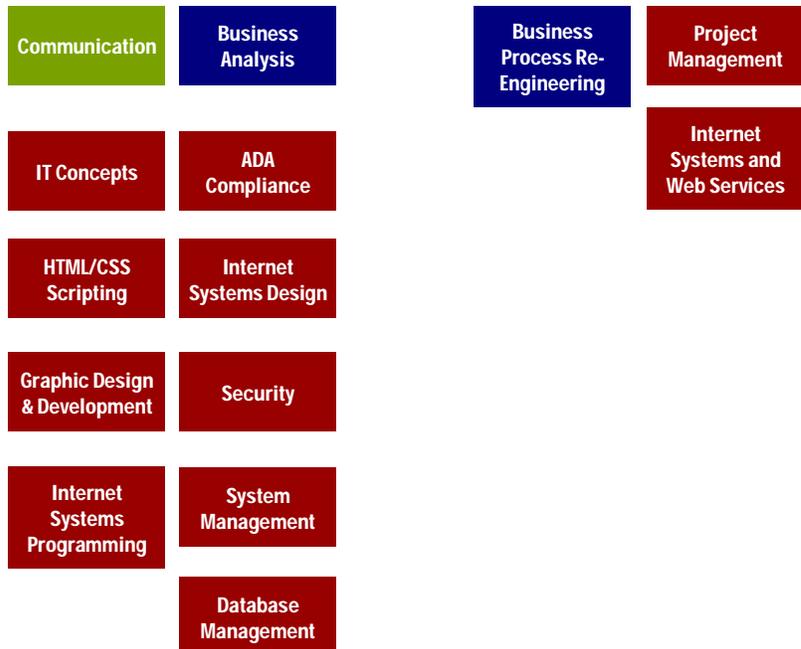
This level can be both in a training capacity or work of limited complexity, relative to the work in the class series, with little or no latitude to vary methods or procedures. Work is usually performed under close supervision. Work is frequently of a basic and recurring nature. This level must be familiar with generally accepted IT concepts, practices, methods and principles.

### JOURNEY II

An individual who has sufficient skills and knowledge of essential IT competencies either through training or practical on-the-job work experience to plan, design, lead or implement solutions to business or IT problems.

### ADVANCED III

This level demonstrates the highest level of technical knowledge, business expertise and leadership in meeting the State's most critical application development needs. Demonstrates expertise in their area of specialization and possesses an extensive perspective on evolving industry trends, practices and standards.



#### LEGEND



Note: Competencies are progressive and are reflected at the earliest level.



# Web / *Internet* Development

## **ESSENTIAL** Competencies

### Ability to

No Essential Competencies Exist— Refer to Desirable Competencies

### Knowledge of

No Essential Competencies Exist— Refer to Desirable Competencies

## **DESIRABLE** Competencies

### Ability to

#### Soft Skills

- provide information and assistance to customers
- provide technical leadership on group projects
- represent the organization in interactions with other organizations

#### Business Skills

- conduct analyses and recommend resolution of complex issues affecting the specialty area
- evaluate established methods and procedures and prepare recommendations for changes in methods and practices where appropriate
- prepare and present reports

### Ability to

#### Technical Skills

- advise other IT experts throughout the organization and in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices, that are developed by the applicant or the applicant's leadership
- advise web site content providers in the appropriate use of copyrighted electronic property on web sites
- build and implement web-enabled database applications
- carry out server maintenance functions
- convert user-developed content into workable Web pages
- create basic scripts or code
- create easily navigable Web pages
- create Internet applications that enhance user-developed content and meet business and technical requirements
- create web pages that enable all potential users to access information contained on the web pages
- deliver e-commerce and e-Government products and services to internal and external customers
- develop new theories, concepts, standards and methodologies in Web technology
- ensure optimal use of commercially available products
- ensure that Web-based content is accessible to all users
- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- evaluate code and repair errors
- evaluate proposals for the acquisition of IT products or services
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- interpret IT policies, standards, and guidelines
- manage Internet servers
- plan and carry out difficult and complex assignments and develop new methods, approaches and procedures
- prepare and update manuals, instructions and operating procedures
- provide advice and guidance on a wide range and variety of complex IT issues
- provide guidance in determining the most appropriate methods for delivering information via the Internet
- provide Internet services such as Web sites and file transfer protocol sites
- provide Internet support services that optimize customer experiences
- provide technical direction/leadership of program or project work
- select and apply the most effective delivery formats
- serve as senior expert and consultant to executive management to advise on integrating complex interactive web-based network applications using live relational databases with other programs of equivalent scope and complexity
- test and optimize the functionality of systems, networks and data

<Entry Level Continued On Next Page >



# Web / *Internet* Development

< Entry Level Continued From Previous Page >

## DESIRABLE Competencies

### Knowledge of

#### Soft Skills

- principles of organizational development and IT change management theories and their application in the IT environment

#### Business Skills

- acquisition management policies and procedures
- oral and written communication techniques
- analytical methods and practices
- cost-benefit analysis principles and methods
- performance management/measurement methods, tools, and techniques
- principles of organizational financial management
- the missions and programs of customer organizations

### Knowledge of

#### Technical Skills

- advanced Internet technologies
- advanced Web-administration tools
- backup/recovery procedures for the Web and Internet environments
- basic Internet server maintenance techniques
- basics of operating system hardware, client side support and server side support
- COTS products and components
- database management principles and methods as used on the Internet
- file formats used in the delivery of Web content
- generally accepted IT concepts, practices, methods and principles
- impact of the Web installation plan on the whole IT system
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- Internet clients, such as browsers and streaming audio
- Internet design principles and methods
- Internet security principles and protocols
- Internet server operations and operating systems
- Internet services architecture, operations and operating systems
- IT practices and methods (current and trends) for IT strategic planning
- IT project management principles and methods
- IT security principles and methods
- multimedia principles, methods and tools
- new and emerging information technologies and/or industry trends
- new and emerging tools and technologies, programming languages, and distributed computing and computing platforms
- requirement analysis principles and methods
- standard graphics, mark-up languages, programming languages and tools
- standard Internet protocols
- standard software validation tools
- systems testing and evaluation principles, methods and tools
- technical requirements of graphical text and voice based browsers
- usability concepts, navigational aids, site architecture, knowledge management and information rendering
- web administration tools
- web-based application and accessibility technologies



# Web / *Internet* Development

## **ESSENTIAL** *Competencies*

### Ability to

#### Soft Skills

- provide information and assistance to customers

#### Business Skills

- conduct analyses and recommend resolution of complex issues affecting the specialty area
- evaluate established methods and procedures and prepare recommendations for changes in methods and practices where appropriate

#### Technical Skills

- build and implement web-enabled database applications
- carry out server maintenance functions
- convert user-developed content into workable Web pages
- create basic scripts or code
- create easily navigable Web pages
- create Internet applications that enhance user-developed content and meet business and technical requirements
- create web pages that enable all potential users to access information contained on the web pages
- deliver e-commerce and e-Government products and services to internal and external customers
- ensure that Web-based content is accessible to all users
- evaluate code and repair errors
- identify and define business or technical requirements applied to the design, development, implementation, management, and support of systems and networks
- interpret IT policies, standards, and guidelines
- plan and carry out difficult and complex assignments and develop new methods, approaches and procedures
- prepare and update manuals, instructions and operating procedures
- provide guidance in determining the most appropriate methods for delivering information via the Internet
- provide Internet services such as Web sites and file transfer protocol sites
- provide Internet support services that optimize customer experiences
- provide technical direction/leadership of program or project work
- select and apply the most effective delivery formats
- test and optimize the functionality of systems, networks and data

### Knowledge of

#### Business Skills

- oral and written communication techniques
- analytical methods and practices
- performance management/measurement methods, tools, and techniques
- the missions and programs of customer organizations

#### Technical Skills

- basic Internet server maintenance techniques
- basics of operating system hardware, client side support and server side support
- database management principles and methods as used on the Internet
- file formats used in the delivery of Web content
- generally accepted IT concepts, practices, methods and principles
- IT performance monitoring principles and methods
- IT quality assurance principles
- IT systems development life cycle management concepts
- IT systems security methods and procedures
- IT technical documentation methods and procedures
- Internet clients, such as browsers and streaming audio
- Internet design principles and methods
- Internet security principles and protocols
- Internet server operations and operating systems
- Internet services architecture, operations and operating systems
- IT security principles and methods
- multimedia principles, methods and tools
- new and emerging information technologies and/or industry trends
- requirement analysis principles and methods
- standard graphics, mark-up languages, programming languages and tools
- standard Internet protocols
- standard software validation tools
- systems testing and evaluation principles, methods and tools
- usability concepts, navigational aids, site architecture, knowledge management and information rendering
- web administration tools
- web-based application and accessibility technologies

<Journey Level Continued On Next Page >



# Web / *Internet* Development

< Journey Level Continued From Previous Page >

## DESIRABLE Competencies

### Ability to

#### Soft Skills

- provide technical leadership on group projects
- represent the organization in interactions with other organizations

#### Business Skills

- prepare and present reports

#### Technical Skills

- advise other IT experts throughout the organization and in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices, that are developed by the applicant or the applicant's leadership
- advise web site content providers in the appropriate use of copyrighted electronic property on web sites
- develop new theories, concepts, standards and methodologies in Web technology
- ensure optimal use of commercially available products
- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- evaluate proposals for the acquisition of IT products or services
- manage Internet servers
- provide advice and guidance on a wide range and variety of complex IT issues
- serve as senior expert and consultant to executive management to advise on integrating complex interactive web-based network applications using live relational databases with other programs of equivalent scope and complexity

### Knowledge of

#### Soft Skills

- principles of organizational development and IT change management theories and their application in the IT environment

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods
- principles of organizational financial management

#### Technical Skills

- advanced Internet technologies
- advanced Web-administration tools
- backup/recovery procedures for the Web and Internet environments
- COTS products and components
- impact of the Web installation plan on the whole IT system
- IT practices and methods (current and trends) for IT strategic planning
- IT project management principles and methods
- new and emerging tools and technologies, programming languages, and distributed computing and computing platforms
- technical requirements of graphical text and voice based browsers



# Web / *Internet* Development

## **ESSENTIAL** Competencies

in addition to journey level essential competencies

### Ability to

#### Soft Skills

- provide technical leadership on group projects
- represent the organization in interactions with other organizations

#### Business Skills

- prepare and present reports

#### Technical Skills

- advise other IT experts throughout the organization and in other organizations on a variety of situations and issues that involve applying or adapting new theories, concepts, principles, standards, methods, or practices, that are developed by the applicant or the applicant's leadership
- advise web site content providers in the appropriate use of copyrighted electronic property on web sites
- develop new theories, concepts, standards and methodologies in Web technology
- ensure optimal use of commercially available products
- evaluate and recommend adoption of new or enhanced approaches to delivering IT services
- evaluate proposals for the acquisition of IT products or services
- manage Internet servers
- provide advice and guidance on a wide range and variety of complex IT issues
- serve as senior expert and consultant to executive management to advise on integrating complex interactive web-based network applications using live relational databases with other programs of equivalent scope and complexity

### Knowledge of

#### Soft Skills

- principles of organizational development and IT change management theories and their application in the IT environment

#### Business Skills

- acquisition management policies and procedures
- cost-benefit analysis principles and methods
- principles of organizational financial management

#### Technical Skills

- advanced Internet technologies
- advanced Web-administration tools
- backup/recovery procedures for the Web and Internet environment
- COTS products and components
- impact of the Web installation plan on the whole IT system
- IT practices and methods (current and trends) for IT strategic planning
- IT project management principles and methods
- new and emerging tools and technologies, programming languages, and distributed computing and computing platforms
- technical requirements of graphical text and voice based browsers

## **DESIRABLE** Competencies

### Ability to

Refer to Entry and Journey Level Competencies

### Knowledge of

Refer to Entry and Journey Level Competencies

# Soft Skills TRAINING

## Analytical Skills

- ▲ Completed Staff Work
- ▲ Developing Analytical Skills
- ▲ Introduction to Analytical Staff Work
- ▲ Introduction to Critical Thinking
- ▲ Problem Solving and Decision Making

## Communication

- ▲ Business Writing
- ▲ Communicating with Data
- ▲ Communication for Information Technology Professionals
- ▲ Communication Skills
- ▲ Dealing with Difficult People
- ▲ Developing Dynamic Presentation Skills
- ▲ Effective Communication Skills
- ▲ Effective Presentations
- ▲ Grammar
- ▲ Written Communication

## Customer Service

- ▲ Business Etiquette
- ▲ Customer Service Excellence
- ▲ Interpersonal Skills
- ▲ The Conference on Customer Service
- ▲ Understanding Yourself and Others

Knowing is not enough; we must apply. Willing is not enough; we must do.

DARNELL LAWRENCE



To learn, you must want to be taught.

*Proverbs 12:1*

CHERYL DOBBINS



It is a long road that has no turning. *Irish Proverb*

JENNY KENNEDY



Everything the human mind can imagine will be reality one day.

FAY LYNN



Failing to plan is a plan to fail.

JERRY MERCADO



# Soft Skills TRAINING

## Documentation

- ▲ Creating Technical Documentation
- ▲ Documentation
- ▲ Documenting Policies & Procedures
- ▲ Principles of Usability
- ▲ Sentence Aerobics
- ▲ Technical Concepts and Tools
- ▲ Technical Report Writing
- ▲ Technical Writing
- ▲ Technical Writing and Documentation
- ▲ Writing for the Web

## Editing

- ▲ Target Editing / High Impact Thinking
- ▲ Technical Writing and Editing

## Leadership

- ▲ Assertiveness Skills: Communicating with Authority & Impact
- ▲ Exercising Influence: Building Relationships & Getting Results
- ▲ Influence Skills
- ▲ Leadperson Workshop
- ▲ Motivating IT Professionals
- ▲ Time Management



What lies behind us and what lies before us are small matters compared to what lies within us. *Ralph Waldo Emerson*

JOE RIVERA

The largest room in the world is the room for improvement.

*Anonymous*

MARGARITA HARD



Don't be afraid to go out on a limb... that's where you will find the fruit.

CAROLINE MYERS



The only real mistake is the one from which we learn nothing.

*John Powell*

GEORGIA MYERS



To have vision is to never stop dreaming.

LINDA ADAMS



# Soft Skills TRAINING

## Negotiation

- ▲ Communication and Negotiation
- ▲ Conflict Management
- ▲ Conflict Resolution
- ▲ Effective Negotiations
- ▲ Negotiating to Win
- ▲ Negotiation Skills
- ▲ Strategies For IT & Technical Professionals
- ▲ Strategies Skills

## Presentation

- ▲ Effective Presentations Skills
- ▲ Presentation Graphics
- ▲ Presentation Skills

## Technical Writing

- ▲ Creating Manuals & User Guides
- ▲ Creating Technical Documentation
- ▲ Introduction to Technical Writing Certificate Program
- ▲ Technical Writing Seminar

## Training

- ▲ Facilitating Forward: Guiding Others Toward Results
- ▲ Meeting Management and Group Facilitation
- ▲ Train the Trainer

We must continue to learn as long as the world around us continues to change.

CARRIE SPENCER



Great leaders are not followers. They inspire people to follow them.

JOHN DONG



The great aim of education is not knowledge but action.

*Herbert Spencer*

JAMES WILLIAMSON



The secret of joy in work is contained in one word - excellence. To know how to do something well is to enjoy it.

*Pearl S. Buck*

FEI LING COLLIER



# BUSINESS skills TRAINING

## Architecting Business Solutions

- ▲ Discovering Essential Business Requirements
- ▲ Power, Politics & change leadership for Project Managers
- ▲ Working with Strategic Business Partners

## Budgets

- ▲ Budget Change Proposal Overview
- ▲ Budget Process Workshop
- ▲ Business Essentials
- ▲ Finance for Non-Financial Professionals

## Business Analysis

- ▲ Business Analysis
- ▲ Business Process Re-engineering
- ▲ Collecting Effective Business Requirements
- ▲ Developing a Solid Business Case
- ▲ Introduction to Analysis and Design
- ▲ Introduction to Business Analysis
- ▲ Program Analysis & Evaluation

## Business Process Re-Engineering

- ▲ Business Process Re-Engineering
- ▲ Program Analysis & Evaluation

## Contingency Planning

- ▲ Disaster Recovery Planning: Ensuring Business Continuity

Example isn't another way to teach, it is the only way to teach.

WILLIAM PENG



An organization's ability to learn, and translate that learning into action rapidly, is the ultimate competitive advantage.

*Jack Welch*

DAVID HARRIS



Information technologies may come and go, but the mind will always grow.

KURTIS KNAPP



Nothing is ever always wrong. Even a clock that stops is right twice a day. *Anonymous*

LAURIE BROWN



The surest path to wisdom is education.

KUMAR KALAGARA

# BUSINESS skills TRAINING

## Feasibility Study

- ▲ Conducting a Feasibility Study
- ▲ Feasibility Study Reports

## Management

- ▲ A Manager's Guide to Information Technology
- ▲ Management Skills

## Organizational Business Processes

- ▲ Change Management
- ▲ Project Procurement Management
- ▲ Organizational Development

## Procurement

- ▲ Cal-PCA Basic Certificate Program
- ▲ Contracting for Project Managers
- ▲ Leveraged Procurement Agreements (LPA) Technical
- ▲ Non-Competitively Bid
- ▲ Purchasing Contract Management
- ▲ Services Contracting

## Strategic Planning

- ▲ Strategic Planning
- ▲ Working with Strategic Business Partners



You never know where you are going until you get there.

CHERYL HANKS



Everyone takes the limits of their own field of vision for the limits of the world. Expand your vision—learn!

EDUARDO R. ECHEVERRIA



Where there's a will, there's a way.

*Anonymous*

BRIAN J. PARKS



Knowledge is the key to achievements.

THERESE HART



ITMA provides invaluable networking opportunities for your career.

JULIE WHITTEN

# *Special* **APPRECIATION**

## **ITMA XII Members**

Linda M. Adams  
Laurie Brown  
Fei Ling Collier  
Cheryl Dobbins  
John Dong  
Karryl Downing  
Eduardo R. Echeverria  
Chery Hanks  
Clay Harada  
Margarita Haro  
David Harris  
Therese Hart  
Kumar Kalagara  
Jenny Kennedy  
Kurtis Knapp  
Darnell Lawrence  
Fay Lynn  
Gerardo (Jerry) Mercado  
Caroline Myers  
Georgia Myers  
Brian J. Parks  
William Peng  
Joe Rivera  
Carrie Spencer  
Julie Whitten  
James Williamson

## **ITMA XII Class Managers**

Melody Hayes  
Christy Quinlan  
Larry Smith

## **ITMA XII Executive Sponsors**

John Hamlin  
Mike Howland  
Dan Whetstone

## **ITMA Support**

Health & Human Services Agency Data Center

## **Contributors**

Bob Austin  
Cheryl Barquest  
Ann Barsotti  
Dick Brothers  
Mitch Coppin  
Clark Kelso  
Karen Lynch  
Claudina Nevis

## **Operational Support**

Puthika Chau  
Paula Fendick  
Theresa Lea  
Sara Petlowany  
Susie Shoemaker

## **Printing, Binding & CDs**

California State Lottery Commission  
California Student Aid Commission  
Department of Justice  
Franchise Tax Board

## **Survey Hosting & Development**

Jeremy Fong  
Stephen P. Teale Data Center

## **Web Hosting**

Resources Agency

## **Participating Survey Departments**

Agricultural Labor Relations Board  
Board of Control  
Board of Corrections  
Board of Equalization  
California Conservation Corps  
California Horse Racing Board  
California State Lottery Commission  
California Student Aid Commission  
Commission Peace Officer Standards & Training  
Department Housing & Community Development  
Department of Consumer Affairs  
Department of Corporations  
Department of Corrections  
Department of Developmental Services  
Department of Finance  
Department of Financial Institutions  
Department of Fish and Game  
Department of Forestry & Fire Protection  
Department of General Services  
Department of Health Services  
Department of Insurance  
Department of Justice  
Department of Mental Health  
Department of Motor Vehicles  
Department of Parks & Recreation  
Department of Pesticide Regulation  
Department of Rehabilitation  
Department of Social Services  
Department of the Youth Authority  
Department of Transportation  
Department of Veterans Affairs  
Department of Water Resources  
Emergency Medical Services Authority  
Employment Development Department  
Franchise Tax Board  
Health & Human Services Agency Data Center  
Managed Risk Medical Insurance Board  
Office Environmental Health Hazard Assessment  
Office of Administrative Law  
Office of Emergency Services  
Office of State Health Planning & Development  
Office of Traffic Safety  
Public Employees' Retirement System  
Resources Agency  
State Controller  
State Independent Living Council  
State Lands Commission-Headquarters  
State of California Public Utilities Commission  
State Personnel Board  
State Teachers' Retirement System  
State Treasurer  
State Water Resources Control Board  
Stephen P. Teale Data Center