

# Classification and Qualification



# STANDARDS

The California State University System

## Information Technology Series Analyst/Programmer

### CLASSIFICATION OVERVIEW

Positions in this classification are primarily responsible at varying levels for the analysis, design, modification, installation and maintenance of application programs, integrated systems, or software solutions including databases to meet user and organizational information needs at the systemwide, campuswide, or individual unit level.

Positions in this classification may reside in the central computing department or in individual administrative or academic departments or schools. Common working titles include Applications Programmer, Software Developer, Systems Analyst, Programmer/Analyst, Database Analyst, Data Administrator, Data Analyst, etc.

### ENTRY QUALIFICATIONS

To enter this classification, a basic foundation of knowledge and skills in applications programming and systems analysis and related programming support functions is a prerequisite. This foundation would normally be obtained through a bachelor's degree, preferably in computer science or business, or equivalent training and applied experience. Foundation knowledge and skills for the Analyst/Programmer, depending on the position assignment, may include working knowledge of a specific industry standard applications programming language and knowledge of standard systems analysis techniques.

Further progress within this classification is based on department needs and work assignments requiring higher levels of skills and knowledge. *Refer to the Information Technology Series Introduction for skill level definitions.*

### CORE FUNCTIONS

The core functions of the Analyst/Programmer are:

- Systems Analysis and Development
- Applications Programming
- Database Analysis

These core functions represent major categories of work within the Analyst/Programmer classification. Typical activities and core skills for each core function cited below are illustrative; campus assignments may vary.

## **CORE FUNCTION**

### **Systems Analysis and Development**

#### **Examples of Typical Activities:**

##### **Systems Analysis:**

Analyze user system and application needs, determine and evaluate alternative solutions and approaches to meeting those needs, and select the optimal technology solution. Examples of typical work activities include:

- Consult with users to identify and document software/system purpose, work flow issues, output needs and to determine overall functional and technical system requirements and specifications;
- Develop alternative solutions and conduct feasibility studies;
- Evaluate the procurement of third party software and troubleshoot new software installations.

##### **Systems Development:**

Develop specifications and requirements for the optimal integration and implementation of systems and equipment. Examples of typical work activities include:

- Develop requests for proposals for system components;
- Evaluate specifications and requirements against available systems;
- Design fully integrated systems which may include applications, databases, networks, and related systems;
- Ensure system integrity and efficiency.

##### **Application Design/Modification:**

Design application programs to meet user requirements that optimize the use of available resources. Examples of typical work activities include:

- Develop program specifications and review them with the user to ensure that requirements are met;
- Design user-friendly interfaces to systems, applications, and databases;
- Recommend modifications to third party software to meet user needs;
- Act as a software vendor liaison.

## **CORE SKILLS**

### **Systems Analysis and Development**

- Ability to use systems work flow and logic flowchart techniques.
- Knowledge of formal data flow analysis methodologies.
- Ability to apply and use operations analysis and structured design analysis techniques.
- Knowledge of campus-defined systems, applications, and standards.
- Ability to identify hardware/software interface problems.
- Knowledge of system/equipment capability, design restrictions, and security requirements.
- Knowledge of system development life cycle and structured systems development concepts.
- General knowledge of network connectivity, integration, configuration, and protocols.
- Understanding of and ability to integrate all systems including operating systems, applications, network, and databases, as well as knowledge of distributed processing technology.
- Knowledge of client/server technologies.
- Ability to communicate effectively.
- Ability to apply consultative skills to assess user needs and communicate technology systems and solutions.
- Ability to perform systems and applications needs analysis, prepare requests for proposals, and conduct feasibility studies.
- Ability to use project management tools.
- Ability to research and evaluate the functionality of vendor software to meet user needs, assess vendor proposals, and serve as a technical/vendor liaison.

## **CORE FUNCTION**

### **Application Programming**

#### **Examples of Typical Activities:**

##### **Programming and Software Development:**

Develop succinct, timely programming code or modify software in a logical fashion which optimizes programming resources and meets functional user requirements. Examples of typical work activities include:

- Write code to meet user specifications;
- Use productivity tools to develop and modify applications software to meet user needs;
- Work with users to test and debug programs;
- Verify data acquisition and output media and format;
- Modify existing or third party software;
- Write documentation to provide user support for new or modified programs and production/operation procedures.

##### **Applications Installation and Maintenance:**

Maintain and support assigned systems to ensure minimal downtime and loss of productivity and service.

Examples of typical work activities include:

- Evaluate and enhance the efficiency of existing programs in meeting current and future user needs;
- Maintain and support associated databases;
- Install new, modified or third party software releases and/or updates;
- Evaluate and supplement vendor supplied documentation for third party software.

## **CORE SKILLS**

### **Application Programming**

- Ability to use one or more industry standard programming languages and various report/screen generators as required by the position.
- Ability to use applications software, data structures and utilities, operating systems, and communication interfaces within the computing environment.
- Ability to perform interactive debugging and to test and analyze program failures.
- Knowledge of structured programming techniques and the ability to use appropriate productivity tools to provide for more rapid development of applications.
- Ability to write/modify programs using multiple applications and databases.
- Ability to develop program implementation plans, install software, and apply fixes.
- Understanding of technical and vendor documentation and ability to maintain internal documentation.
- Knowledge of network configuration, programming, and protocols.
- Specialized skills in new systems and programming technologies.

## **CORE FUNCTION**

### **Database Analysis**

#### **Examples of Typical Activities:**

##### **Analysis:**

Structure, implement and maintain database systems to optimize data access and security. Examples of typical work activities include:

- Design database systems and programs which include access methods, access time file structures, device allocation, validation checks, statistical methods, and security
- Work with user community to understand data access and integration needs;
- Ensure the integration of systems through the database structure;
- Monitor database standards and procedures, system usage and performance;
- Troubleshoot and resolve database and data problems;
- Develop and administer disaster recovery plans.

##### **Administration and Support:**

Establish and administer policies, standards and procedures for strategic data planning, data analysis and modeling, and data element standardization and use to ensure accurate, useful and readily accessible data.

Examples of typical activities include:

- Develop and administer data use policies, procedures, and standards.
- Monitor, analyze, and verify data to ensure data integrity; develop assigned databases to support specific applications.
- Analyze data requirements, develop and document data dictionary, and develop data models.
- Maintain the database archives by acquiring and installing data sets and documentation.
- Assist in data transfers or sharing of files.
- Develop policies and procedures to access or interact with remote resources.
- Conduct file maintenance.
- Maintain the data dictionary.

## **CORE SKILLS**

### **Database Analysis**

- Knowledge of formal data structure design, relational database design, and file structure.
- Ability to design data structures to maximize efficiency and flexibility.
- Ability to perform database maintenance tasks, develop access routines, and maintain dictionary.
- Knowledge of data administration principles and data modeling concepts.
- Ability to identify and resolve software/hardware interface problems, data requirements, and access methods.
- Ability to establish and execute data security standards and procedures and disaster recovery plans.
- Knowledge of distributed processing and client/server technologies.
- Ability to perform database backup and recovery procedures as part of database management system utilities.
- Ability to use data resource and productivity tools applicable to the database management system.
- General knowledge of network configuration, programming, and protocols.
- Ability to provide database support in a multiple hardware platform and operating system environment.
- Ability to work and communicate with users to define and meet database needs and requirements.