SANTA CRUZ COUNTY OFFICE OF EDUCATION

SYSTEMS ENGINEER

DEFINITION
Under general direction of the assigned supervisor, the Systems Engineer (consisting of the following engineer positions: Network Engineer, Software Engineer, and Data Engineer) designs, develops, analyzes, implements, and maintains highly complex computer and network systems for the County Office and all districts. Provides high-level support, problem solve and assist in all areas of computer hardware and software, including upgrades, maintenance, and repairs.

SUPERVISION EXERCISED
May exercise technical and functional supervision over lower-level staff.

EXAMPLES OF IMPORTANT AND ESSENTIAL DUTIES
Communicate effectively with County Office and district staff regarding features or problems and required solutions.

Work closely with other staff in a positive fashion.

Participates in continuous learning, professional development, training, and ongoing education as needed to stay current with emerging technologies, industry best practices and data security standards.

Operates a computer, a variety of software, and other office equipment as assigned; drives a vehicle to conduct work as assigned.

Identify and develop process improvements.

Perform related job duties and responsibilities as assigned.

OTHER JOB RELATED DUTIES
In addition to the above general example of duties, specific activities may require specialized duties as follows:

Network Engineer
Assist in the daily activities of the County Office, including but not limited to, attending weekly planning meetings, completing assigned tasks, and overseeing project completion.

Responsible for the installation, troubleshooting, repairing, and maintaining the County Office's and district's local and wide area network equipment including, but not limited to, Cisco routers and switches.

Oversee and continue to develop the virtual server environment and maximize uptime of the entire LAN/WAN.

OTHER JOB RELATED DUTIES (CONTINUED)

Assist in planning, developing, and coordinating the installation, updating, and administration of all computer services of the County Office and its schools.

Assure proper operation of the County Office, district and schools' LAN and WAN including Cisco routers, Active Directory, Exchange databases, and other related hardware and software.

Assist in troubleshooting, repairing, monitoring and maintaining all LAN/WAN networks connection.

Assist in the installation of computers, hardware, software on computers, and networks as needed.

Assist in developing and implementing equipment and software security policies and procedures.

Create, develop, and implement, in conjunction with the aid of a committee, network security, and disaster recovery policies and procedures to protect the integrity of the data stored on the network.

Stay abreast of new technologies, and their applications.

Advise on hardware and software purchases.

Software Engineer

Develops, designs, analyzes, implements and maintains complex web-based business application programs using desktop, web-based programming languages and tools; communicates with users and project team members to recommend design options; determines functionality, simulations and programming needed for system requirements.

Reviews program development with clients and modifies as necessary; communicates with clients, users and project team to determine functionality and programming needed for recommended design options or to resolve complex problems.

Designs and codes programs for a clean compile; develops and modifies data flowcharts and diagrams, entity relationship diagrams; documents systems design; tests and scripts programs and databases using web-based interactive technologies; develops screen prototypes; prepares detailed design specifications; analyzes, develops, and tests screen processes.

Write enhancements and document production jobs; monitors and schedules production jobs; determines and analyzes operating characteristics and requirements; schedules project review status of submitted jobs; analyzes and resolves problems as necessary; resubmits jobs as required.

Assists production team test and adjust function, platform independence and user requirements; makes modifications for final changes as necessary.

OTHER JOB RELATED DUTIES (CONTINUED)

Implements the system; prepares production documentation and instructions; prepares and maintains technical and user system manuals; provides training on new procedures.

Creates test plan and test cases; executes unit test and documents results; assists users to develop and execute system test; provides support to client and resolves problems; debugs problem programs; implements new programs.

Creates and maintains computer database systems and tables, Structured query language (SQL) stored procedures and indices; downloads existing data into tables for use in new applications.

Identifies opportunities for operational improvements to existing systems; analyze user work processes, requirements and costs of implementing service requests.

Provides technical assistance for web-based business applications, including hardware and/or software problems resolution to ensure system availability, data integrity, and timely and accurate reporting; documents issues and possible solutions/recovery procedures.

Compiles and generates special reports, creates tables, forms and queries; prepares and presents progress reports.

Works within the data and analytics engineering and other development teams as a resident expert in the areas of cloud systems and networking within and between private and public cloud systems, including detailed implementation and troubleshooting within cloud ecosystems such as Google Cloud Compute, AWS or MS Azure, as well as integration between different systems on disparate cloud data platforms.

Works within the agile engineering process in close collaboration with other engineering efforts necessary to deliver new or enhanced systems into production.

Leads the evaluation of new technology from a system, network integration, and future production support perspective.

Designs, implements, documents, and maintains a software‑defined infrastructure.

Automates cloud native technologies, deploys applications and provisions infrastructure.

Automates business processes through Google Apps Script and/or Microsoft PowerShell.

Implements and maintains the DevOps systems needed to support the agile software development and integration work, including the source control platform, continuous integration, and continuous delivery (CI/CD) workflows and tools, and automated code and configuration deployments.

OTHER JOB RELATED DUTIES (CONTINUED)

Sets up the continuous integration and deployment (CI/CD) pipeline and other DevOps related solutions for full‑stack cloud development using cloud‑based data platform and services; sets up test and production environments; sets up code progressions tools such as GitHub.

Works with other engineers to integrate automated testing; ensures code backups; automates the setup and deployment of code and system changes to development and production environments.

Stays up-to-date on the latest software development technologies and trends.

Prepares solutions for production; ensures system and network configurations are well documented; ensures the implementation design includes the needed security, logging, alerting, and monitoring.

Data Engineer

Designs, builds, and maintains data pipelines and infrastructure.

Creates large datasets and uses their skills in programming, database administration, and cloud computing to build scalable and reliable systems for processing and analyzing data.

Collaborates with the Data, Analytics and Development Department to develop and implement data-driven solutions.

Synthesize a variety of data sources, such as databases, flat files, and Application Program Interface (API)s.

Extracts, transforms, and loads data into target systems.

Automates and streamlines the software development and delivery process.

Works with a variety of tools and technologies to build and maintain infrastructure, automate deployments, and monitor applications.

Collaborates with developers and other engineers to implement DevOps practices.

Stays up-to-date on the latest DevOps tools and technologies.

Implements and supports new data models and associated ETL processes including facilitation of source system data mapping sessions. Troubleshoot and resolve ETL problems.

Maintains and troubleshoots existing data models and associated ETL processes. Ensures that ETL processes are efficient and reliable.

Implements and tests Business Intelligence (BI) solutions such as databases, queries, views, reports, and dashboards.

OTHER JOB RELATED DUTIES (CONTINUED)

Ensures the accuracy, privacy, reliability, security, and accessibility of data in the data warehouse.

Participates in and facilitates the data governance process by enforcing data integrity and data security.

Develops guidelines and recommends process improvements.

Manipulates data conversions, imports, and exports of data within and between internal and external software systems, including data to and from multiple student information systems, agencies, assessments, and vendors.

Assists the Santa Cruz COE data services management team in building and managing a wide variety of data sets.

Performs detailed data validation and audits for data residing in the data warehouse; performs root cause analysis and troubleshooting for data issues when required; creates and documents criteria for assessing data issues and opportunities.

Anticipates potential problems and develops solutions needed to resolve them; systemically analyzes relationships between apparently independent problems and issues and identifies trends as well as isolated events.

Assists in developing and establishing standard procedures and best practices for the data systems technical team; researches and implements new technologies.

Develops and maintains effective working relationships with school districts and vendors; educates and trains district users and others to use the data as an analytical tool, displaying the information in new form and content for analysis and exploring options.

JOB RELATED AND ESSENTIAL QUALIFICATIONS

To perform this job successfully, an individual must be able to perform each essential duty satisfactorily. The requirements listed are representative of the knowledge, skill, and/or ability required.

Knowledge of:

Proper English usage including grammar, spelling, punctuation and sentence structure.

Network Engineer

Principles, operation, and capabilities of network hardware, software, and protocols.

Local and wide area network equipment including, but not limited to, Cisco routers and switches.

Maintaining all LAN/WAN networks connection.

Knowledge of (continued):
Common software programs with ability to learn specialty programs used by the County Office, district and/or schools.

Skill in the use of hardware and protocols specific to the assignments.

The theory and practice of data, computer and network security in a complex environment.

Excellent customer service skills.

Software Engineer
Web application development HTML/JavaScript/CSS .

Server side scripting in Python, Unix/Shell, or other scripting language.

Google Apps Script and/or Microsoft PowerShell scripting.

SQL query design.

Team software development roles and practices.

Web frameworks and libraries such as React and Bootstrap.

Object oriented design and one or more object-oriented programming languages such as Python.

Database performance optimization.

DevOps in cloud computing environments.

Systems analysis and design.

Emerging technologies and software.

Current versions of web development programs and languages.

Current version of Internet Information servers and assigned databases.

Systems and networking including experience with detailed setup and integration utilizing one of the larger cloud ecosystems, e.g., Microsoft Azure, Amazon Web Services (AWS), Google Cloud (GCP).

Identity and Access Management, Virtual Private Clouds and peering, monitoring, alerting, audit logging, and hybrid cloud solutions.

Modern data platforms such as queue/messaging, data transformation services, API gateways, cloud data warehouse platforms like Snowflake, etc.

Knowledge of (continued):
Containerization and infrastructure management tools like Docker and Kubernetes.

Data Engineer
Strong programming skills in Python, JavaScript, or other programming languages including object-oriented design.

Cloud computing platforms such as AWS, Azure, or Google Cloud Platform (GCP).

Database technologies (Structured query language (SQL) and NoSQL).

Data warehousing technologies such as BigQuery, Hadoop, Hive, or Spark.

ETL, data warehouse, data mining, data optimization, and data visualization tools.

SQL query design and server‑side scripting techniques, as well as client‑side technologies such as JavaScript, HTML, and CSS.

Incident management and process management applications like Cherwell, and Jira.

Agile software development and building high quality, testable, and maintainable software.

Data governance concepts.

Product and software development lifecycles.

Team software development roles and practices.

Software development life cycle concepts.

Google Workspace.

Systems analysis and design.

Skill and Ability to:
Speak clearly and concisely both in oral and written communication.

Perform duties with awareness of all County Office and district requirements and Board of Education policies.

Interact and work effectively and harmoniously with all levels of internal and external customers, utilizing superior customer service/user-support skills.

Accept and take direction from the immediate supervisor as required.

<u>Skill and Ability to (continued):</u>
Read, analyze, and interpret software and hardware documentation, technical manuals and guidebooks, general   business periodicals, professional journals, technical procedures, or governmental regulations.

Write reports, business correspondence, procedure manuals, and software/network documentation.

Effectively use programmer development environment software.

Operate, maintain, manipulate and design solutions using Content Management Systems, Learning Management Systems or other third-party tools and software.

Create rapidly deployed and customer service focused applications.

Effectively troubleshoot, test, and use logic and analysis to solve complex computer and system problems.

Maintain database systems.

Communicate effectively in both oral and written form.

Interpret technical procedures and documentation and explain technical concepts in non-technical terms to clients and users.

Conduct small group and individual client training.

Prepare correspondence, technical reports and user guides and procedure manuals.

Prioritize, organize and schedule work assignments and projects.

Work under limited supervision with only occasional instruction and assistance.

Establish and maintain cooperative work relationships with those contacted in the performance of required duties.

Integrate document management system and documents with Web pages.

Effectively present information and respond to questions from groups of stakeholders including district technology and County Office staff and vendors.
Communicate with staff in a variety of situations.

Define problems, collect data, establish facts, and draw valid conclusions.

Interpret an extensive variety of technical instructions in mathematical or diagram form and deal with several abstract and concrete variables.

Skill and Ability to (continued):
Must be able to establish and maintain effective, positive working relationships with all technical staff, County Office and district staff members. The ability to assist in bringing the Computer Services staff to a consensus as a team.

Be courteous and maintain a neat and clean appearance, and demeanor at all times.

EDUCATION and EXPERIENCE
Any combination equivalent to experience and training that would provide the required knowledge, skills, and abilities would be qualifying. A typical way to obtain the knowledge, skills, and abilities would be:

Education:
Completion of two years of college with a BA degree preferred. Post-secondary training in information technologies or related fields required.

Experience:
Three to five years of increasingly responsible experience.

Network Engineer
Basic knowledge of VMWare, Microsoft Server, Cisco iOS, UNIX, and FreeBSD.

Software Engineer
Experience in software application development or closely related experience that demonstrates the knowledge and ability to assume responsibility for the programming function.

Data Engineer
Experience in data engineering and/or supporting and developing data warehouses or related data pipelines or data visualization environments.

License or Certificate:
Possession of, or ability to obtain, a valid California driver's license and appropriate vehicle operation insurance.

Network Engineer
Cisco Certified Network Associate or Cisco Certified Design Associate certification desired. Microsoft Certified Professional certification desired. Gsuite Administrator Certification desired.

Qualification Requirements
To perform a job successfully, an individual must be able to perform each essential duty satisfactorily. The requirements listed in the job description are representative of the knowledge, skills, and abilities required. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

SPECIAL REQUIREMENTS

The physical demands described here are representative of those that must be met by an employee   to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. Essential duties require the following physical skills and work environment:

While performing the duties of this job, the employee is regularly required to sit, stand, and move about the work area; use hands or handle, fingers, and feel objects, tools, or controls; and talk or hear. The employee may occasionally lift and/or move objects up to 50 pounds. Specific vision abilities required by the job include close vision and depth perception. The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job.

Ability to work in a standard office environment with some ability to travel to different sites and locations

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