Domain 1: Business Technology Management

Subject Area & Description	Functional Titles	Classifications
Asset Management Manage hardware and software assets according to ITAM standards, including acquisition, licensing, deployment, inventory, and retirement.	IT Asset Management Specialist Senior IT Asset Management Specialist IT Asset Management Supervisor IT Asset Management Manager	Information Technology Technician Information Technology Associate Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II
Budgeting and Procurement Manage and process IT budgeting, procurement, and purchasing.	Procurement Analyst Resource Analyst IT Budget Specialist IT Business Management Analyst IT Procurement Specialist IT Contract & Procurement Specialist IT Consulting Services IT Budget & Procurement Supervisor IT Hardware & Software Procurement Supervisor IT Contract & Fiscal Manager Performance & Contract Manager Procurement Manager IT Budget & Procurement Manager Resource Manager Technology & Business Manager Chief Procurement Officer Procurement Chief	Information Technology Associate Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II
Business Analysis and Performance Analyze processes, workloads, and operational services and identify issues/opportunities using industry-standards.	IT Business Relationship Analyst Senior Business Analyst Project Manager Solutions Architect	Information Technology Technician Information Technology Associate Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II
Contract Administration Manage IT contract processes, including vendor performance.	IT Contract Procurement Specialist/Manager Senior IT Contract Specialist IT Contract Supervisor IT Contract Manager IT Procurement & Contract Manager Quality Assurance/Control Manager	Information Technology Associate Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II

Rev. 7/17/2025

Domain 1: Business Technology Management

Subject Area & Description	Functional Titles	Classifications
IT Legislative Management Perform impact analysis on proposed legislation with an IT component.	IT Business Analyst IT Legislative Analyst IT Governance IT Legislative Liaison	Information Technology Associate Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II
IT Strategic Planning Perform research related to IT trends and best practices, and develop strategic plans aligned with business goals.	IT Strategic Analyst Enterprise Architect IT Strategic Advisor IT Continuous Improvement Manager IT Strategy Manager Senior Project Manager	Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Product Management Apply principles of product management - such as customer centricity and iterative development - to service delivery.	Product Analyst Product Specialist Product Manager Senior Product Manager	Information Technology Associate Information Technology Specialist I/II Information Technology Manager I/II
Policy and Program Development Formulate policies/programs related to IT, including IT governance.	IT Policy Analyst Service Designer Governance Support & Portfolio Consultation Specialist IT Policy Specialist IT Policy Supervisor Governance & Performance Manager IT Business Manager IT Governance/Policy Manager Web Services Manager	Information Technology Associate Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II
Technical Writing Produce technical documentation to help people use a product or service, including end-user and system manuals.	IT Technical Writer Content Analyst Content Specialist Content Strategist	Information Technology Associate Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II

Domain 2: Client Services

Subject Area & Description	Functional Titles	Classifications
Application Support Deploy, patch, and troubleshoot client applications.	IT Support Technician Software Application Developer Application Architect IT Asset Manager	Information Technology Technician Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II
End User Device Support Coordinate end user devices, including provisioning, tracking, security, troubleshooting, and decommissioning.	IT Support Analyst End User Support Specialist	Information Technology Technician Information Technology Associate Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II
Help Desk & Service Desk Provide customer support and information related to IT products and services.	Service Desk Technician Field Support Technician IT Support Technician Technical Support Specialist Service Desk Supervisor Service Desk Manager	Information Technology Technician Information Technology Associate Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II
IT Training Develop training materials and conduct IT-related training.	Field Support Technician Service Desk Technician Customer Support Analyst Endpoint Management Analyst Incident/Problem Management Analyst IT Client Support Analyst Service Desk Analyst IT Help Desk End User Support Specialist Service Desk Supervisor Service Desk Manager	Information Technology Technician Information Technology Associate Information Technology Specialist I Information Technology Supervisor I/II Information Technology Manager I/II

Domain 3: Information Security Engineering

Titles for the Information Security Engineering Domain must be aligned with the titles specified within the Cyber Career Pathways Tool (CCPT)[1]. All titles listed within the CCPT are available for use as a working title. Classification must be aligned according to the tasks, knowledge, skills and abilities outlined on the CCPT with the appropriate classification level pursuant to the IT Classifications Allocation Guide and Job Descriptions published by CalHR.

The Cyber Career Pathways Tool presents an interactive way to explore the updated Work Rules within the NICE framework[2]. The tool depicts the cyber workforces according to distinct, yet complementary skill communities. It also highlights core attributes among each of the Work Rules and offers actionable insights for employers, professionals, and those considering a career in cybersecurity.

For more information about navigating the tool, check out the User Guide[3].

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[1] Cyber Career Pathways Tool https://niccs.cisa.gov/tools/cyber-career-pathways-tool
[2] NICE Workforce Framework for Cybersecurity (NICE Framework) https://niccs.cisa.gov/tools/nice-framework
[3] Cyber Career Pathways Tool User Guide https://niccs.cisa.gov/tools/cyber-career-pathways-tool/user-guide

Rev.7/17/2025

Domain 3: Information Security Engineering

Subject Area & Description	Functional Titles	Classifications
Asset Protection Develop and implement programs to protect assets, including personnel, information, software, and hardware.	Business Continuity Analyst Cyber Defense Analyst Information Security Analyst Asset Protection Specialist Information Security Specialist Cyber Threat Intelligence Officer	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Contingency Planning Develop information system disruption recovery plans, including relocation, alternate equipment, or manual methods.	Business Continuity Analyst Information Security Analyst Vulnerability Assessment Analyst Information Security Specialist Information Security Manager Cyber Intel Planner Cyber Ops Planner Cyber Policy & Strategy Planner Disaster Recovery Program Coordinator Secure Software Assessor Security Control Assessor Technical Recovery Coordinator/Officer	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II

Domain 3: Information Security Engineering

Subject Area & Description	Functional Titles	Classifications
Incident Management Plan for, respond to, and investigate security incidents, including detection, reporting, analysis, eradication, and recovery.	Business Continuity Analyst Cyber Defense Analyst Cyber Defense Forensics Analyst Cyber Threat Intelligence Officer/Analyst Digital Forensics Analyst Exploitation Analyst Information Security Analyst Law Enforcement/Counterintelligence Forensics Analyst Threat/Warning Analyst Vulnerability Assessment Analyst Cyber Defense Infrastructure Support Specialist Information Security Specialist Security Control Assessor Information Security Architect Information Systems Security Developer Information Security Engineer Cyber Ops Planner Cyber Crime Investigator Cyber Defense Incident Responder Penetration Tester	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II

Domain 3: Information Security Engineering

Subject Area & Description	Functional Titles	Classifications
Policy & Procedure Development Develop security policies/procedures and training to ensure compliance and create a framework for action.	Cyber Defense Analyst Cyber Security Analyst Cyber Threat Intelligence Officer/Analyst Information Security Analyst Information Security Specialist Systems Security Specialist Technical Support Specialist Communications Security (COMSEC) Manager Cyber Workforce Developer & Manager Knowledge Manager Product Support Manager System Administrator Information Security Architect Cyber Instructional Curriculum Developer Cyber Intel Planner Cyber Ops Planner Cyber Policy & Strategy Planner Information Security Legal Advisor/Counselor	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Privacy Protect against unauthorized use and disclosure of private and personally identifiable information.	Cyber Security Analyst Vulnerability Assessment Analyst Information Security Specialist Systems Security Specialist System Administrator Security Control Assessor Information Security Architect Security Architect Information Systems Security Developer Information Security Engineer Executive Cyber Leader Information Security Legal Advisor/Counselor Privacy Coordinator Privacy Officer	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II

Rev.7/17/2025

Domain 3: Information Security Engineering

Subject Area & Description	Functional Titles	Classifications
Security Compliance Ensure compliance with security and privacy laws, regulations, rules, and standards.	Cyber Security Analyst Information Security Analyst Information Technology Auditor Systems Security Specialist Information Security Specialist Technical Support Specialist Information Security Manager Cyber Policy & Strategy Planner Systems Requirements Planner System Administrator Security Control Assessor Executive Cyber Leader Cyber Workforce Developer/Manager Information Security Legal Advisor/Counselor	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Security Engineering Design and implement application security policies, controls, and procedures to protect the assets within the system.	Business Continuity Analyst Vulnerability Assessment Analyst Cyber Defense Infrastructure Support Specialist Information Security Specialist System Testing & Evaluation Specialist Systems Security Specialist Technical Support Specialist System Administrator Data Analyst/Architect Information Security Architect Security Control Assessor Information Security Engineer Information Systems Security Developer Cyber Intel Planner Cyber Ops Planner Systems Requirements Planner	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II

Domain 3: Information Security Engineering

Subject Area & Description	Functional Titles	Classifications
Security Operations Develop and apply principles, policies, and procedures to monitor, control, and protect cyber infrastructure.	Cyber Defense Analyst Cyber Security Analyst Information Security Analyst Vulnerability Assessment Analyst Cyber Defense Infrastructure Support Specialist Information Security Specialist System Testing & Evaluation Specialist Systems Security Specialist Technical Support Specialist Information Security Architect Secure Software Assessor Information Systems Security Developer Systems Developer Information Security Engineer Cyber Policy & Strategy Planner Systems Requirements Planner	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Security Risk Management Analyze threats and vulnerabilities and consider mitigations and security controls to protect the organization.	Cyber Defense Analyst Cyber Defense Forensics Analyst Cyber Security Analyst Cyber Threat Intelligence Officer/Analyst Digital Forensics Analyst Exploitation Analyst Information Security Analyst Law Enforcement/Counterintelligence Forensics Analyst Threat/Warning Analyst Vulnerability Assessment Analyst Information Security Specialist Cyber Risk Manager Information Security Manager Risk Manager Information Security Architect Risk Officer Cyber Intel Planner Cyber Ops Planner Cyber Defense Incident Responder	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II

Rev.7/17/2025

Domain 3: Information Security Engineering

Subject Area & Description	Functional Titles	Classifications
Security Testing & Assessment Evaluate and validate the organization's security controls, including operations, projects, programs, networks, and systems.	Cyber Defense Analyst Exploitation Analyst Vulnerability Assessment Analyst Information Security Specialist Research & Development Specialist System Testing & Evaluation Specialist System Administrator Secure Software Assessor Security Control Assessor Information Systems Security Developer Software Developer Systems Developer Systems Requirements Planner	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II

Rev.7/17/2025

Domain 4: IT Project Management

Subject Area & Description	Functional Titles	Classifications
Communications Management Plan, collect, store, manage, control, and monitor project information.	Privacy Officer Communicator Project Coordinator IT Project Manager Project/Portfolio Manager	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Contract Management Develop, monitor, and manage IT contract service delivery.	Project Coordinator Contract Manager Project/Portfolio Manager	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Cost Management Plan, estimate, budget, manage, and control project costs.	Data Analyst Project Analyst Project Coordinator Project/Portfolio Manager	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Human Resource Management Plan, train, and lead project teams, including roles/responsibilities, reporting relationships, and staffing.	Data Analyst Project Analyst HR Project Manager Project Coordinator Project/Portfolio Manager	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Integration Management Identify, define, and coordinate project processes and activities.	Data Analyst Project Analyst Project Coordinator Project/Portfolio Manager	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Organizational Change Management Plan and implement project activities to transition organizations to a future state.	Data Analyst IT Change Analyst Project Analyst Project Coordinator IT Change Manager Project/Portfolio Manager	Information Technology Specialist I/II/III Information Technology Supervisor II/III Information Technology Manager I/II

Rev.7/17/2025

Domain 4: IT Project Management

Subject Area & Description	Functional Titles	Classifications
Planning Create and document estimates and forecasts for project resources.	Project Analyst Project Coordinator IT Project Director Project/Portfolio Manager	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Portfolio Management Manage multiple projects and provide a governing body to control/influence and prioritize and govern components of multiple projects.	Project Analyst Project/Portfolio Manager Project Coordinator	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Process Engineering Facilitate changes to processes and use industry standards to perform process analysis.	IT Business Analyst Project Analyst Project/Portfolio Manager Project Coordinator	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Procurement Management Determine and manage the best approach to procure products and services.	Procurement Analyst Project Analyst Project Coordinator Project Manager	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Quality Management Coordinate activities to ensure project products meet pre-defined standards.	Project Analyst Project Coordinator IT Governance Manager Project/Portfolio Manager	Information Technology Specialist I/II Information Technology Supervisor II Information Technology Manager I/II
Risk Management Coordinate processes to identify and mitigate unforeseen impacts to resources, schedule, and scope.	Project Analyst Project Coordinator IT Project Manager Portfolio Manager Risk Manager/Officer	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II

Rev.7/17/2025

Domain 4: IT Project Management

Subject Area & Description	Functional Titles	Classifications
Scope Management Coordinate processes to ensure a project only includes the work necessary to accomplish the goal.	Project Analyst Project Coordinator IT Project Manager/PMO Office Project/Portfolio Manager	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Stakeholder Management Identify people/groups impacted by the project and develop strategies to engage with stakeholders for success.	Project Analyst Project Coordinator IT Project Manager Project/Portfolio Manager	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II
Time/Schedule Management Coordinate processes to define and sequence the tasks and resources for completing the project.	Project Analyst Project Coordinator IT Project Manager Project/Portfolio Manager	Information Technology Specialist I/II/III Information Technology Supervisor II Information Technology Manager I/II

Rev.7/17/2025

Domain 5: Software Engineering

Subject Area & Description	Functional Titles	Classifications
Data Administration Manage data functions, including define, extract, transform, load, sync, and archive.	Data Governance Analyst/Data Steward Enterprise Content Management (ECM) Database Administrator (DBA) Telecommunications Specialist	Information Technology Technician Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Data Architecture Develop standards, analytics, models, and conceptual database designs to govern how data is collected, stored, integrated, and utilized.	IT Data Architect Data Modeler	Information Technology Technician Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Database Development Develop database structure, system monitoring, performance, capacity, and expansion planning.	Senior Programmer Analyst IT Database Administrator Database Architect Geospatial Information Systems (GIS) Specialist	Information Technology Technician Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Product Management Manage IT product lifecycles, including deployment, release, documentation, and maintenance.	Telecommunications Specialist IT Product Manager Strategic Product Manager Senior Strategic Product Manager	Information Technology Technician Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Quality Assurance Minimize defects in IT products and assess for quality solutions and services.	Quality Control Analyst Testing Analyst Software Quality Manager IT Quality Assurance Tester	Information Technology Technician Information Technology Associate Information Technology Specialist I/II Information Technology Supervisor I/II Information Technology Manager I/II
Software Architecture Design standards and structures for software systems.	Application Architect Software Architect Solutions Architect Lead Engineer	Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II

Rev.7/17/2025

Domain 5: Software Engineering

Subject Area & Description	Functional Titles	Classifications
Software Development Analyze and develop detailed software designs and program, test, and maintain software according to requirements.	Enterprise Content Mgmt. (ECM) Infrastructure Administrator Data Engineer Software Engineer Front End Developer Back End Developer Software Application Developer Full Stack Engineer	Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Software Integration Combine software and system components and ensure interoperability and efficiency.	Enterprise Content Mgmt. (ECM) Infrastructure Administrator Application Programming Interface (API) Developer Software Integration Engineer Technical Testing Specialist	Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Solution Design Examine business requirements and define an IT solution to address those requirements.	Database Administrator Full Stack Developer IT Developer UI/UX/CX Specialist	Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II

Rev.7/17/2025

Domain 6: System Engineering

Subject Area & Description	Functional Titles	Classifications
Database Administration Monitor system to improve database structure, performance, and capacity.	Database Administrator System Administrator	Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Data & Analytics Engineering Define and develop code and data infrastructure for the movement and processing of data including transformations of data to support of the missions of programs and services.	Analytics Engineer Extract Transform Load (ETL) Engineer Data Engineer Machine Learning Engineer Principal Data Engineer Principal Analytics Engineer Senior Data Engineer Senior Analytics Engineer Analytics Engineering Manager Data Engineering Manager	Information Technology Specialist I/II/III Information Technology Manager I/II
Enterprise Architecture Manage hardware and software standards for business systems, portfolio management, and program integration.	Cloud Architect Enterprise Architect Integration Architect Solution Architect Senior Cloud Architect Senior Enterprise Architect Senior Integration Architect Senior Solution Architect Principal Cloud Architect Principal Enterprise Architect Principal Integration Architect Principal Solution Architect	Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Identity Management Manage services relating to authentication, audit control, and access.	Identity and Access Management Administrator Network & System Registrar	Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II

Domain 6: System Engineering

Subject Area & Description	Functional Titles	Classifications
Network Architecture Manage network physical components, functional configuration, operational procedures, and protocol formats.	Network Architect Network Security Architect Network Security Analyst	Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Network Operations Monitor and control processes exercised over computer, communication, messaging, or satellite networks.	Network Administrator Server Infrastructure Administrator Network Security Architect Network Security Analyst Network Operations Center (NOC) Technician	Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
Storage Store data in forms for use by a computer or device, including backup and recovery.	Server Administrator Server Infrastructure Administrator Storage Architect Cloud Engineer Systems Engineer	Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
System Administration Acquire, install, or upgrade hardware and software, including upkeep, configuration, and operation of system components including servers and clouds.	Server Administrator System Administrator IT Support Technician Technical Support Specialist	Information Technology Associate Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
System Architecture Define architecture of hardware and software system components and optimize infrastructure, processing, storage, and network resources.	Cloud Architect Infrastructure Architect	Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II
System Integration Bring together component subsystems into one system and ensure all systems are functioning.	Server Administrator API Developer Software Integration Engineer System Integrator	Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II

Rev.7/17/2025

Domain 6: System Engineering

Subject Area & Description	Functional Titles	Classifications
Virtualization Create virtual computer hardware platforms, operating systems, storage devices, and network resources.	Server Administrator Server Infrastructure Administrator IT Infrastructure Manager	Information Technology Specialist I/II/III Information Technology Supervisor I/II Information Technology Manager I/II

Rev.7/17/2025