

Carnegie Mellon University

School of Computer Science



Enterprise Architecture Standards for Education®

Knowledge and Skill Areas (KSAs) Version 7.0 © 2024

Beginning Architect
(0-2 Years of Experience)

Mid-Level Architect
(3-5 Years of Experience)

Senior Architect
(6-10 Years of Experience)

Chief Architect
(10+ Years of Experience)

Related Course or Seminar Name

Area 1 KSAs: Fundamental Concepts and Practices

	Beginning Architect <i>(0-2 Years of Experience)</i>	Mid-Level Architect <i>(3-5 Years of Experience)</i>	Senior Architect <i>(6-10 Years of Experience)</i>	Chief Architect <i>(10+ Years of Experience)</i>
1.1 Architecture and Design for the Digital Age	X	X	X	X
1.2 Key Architecture Terms and Concepts	X	X	X	X
1.3 Core Elements of a Complete Architecture Approach	X	X	X	X
1.4 Value and Risk in Doing Enterprise Architecture	X	X	X	X
1.5 Architecture as a Baseline for Other Best Practices	X	X	X	X
1.6 Architecture in Strategic and Business Planning	X	X	X	X
1.7 Architecture in Data and Application Management	X	X	X	X
1.9 Architecture in Network and Cloud Management	X	X	X	X
1.10 Architecture in Risk Management	X	X	X	X
1.11 Participating in an Architecture Project	X	X	X	X
1.12 Career Paths and Continuous Learning	X	X	X	X

Fundamentals of Enterprise Architecture (Required for CEA)

Area 2 KSAs: Implementing Concepts and Methods

	Beginning Architect <i>(0-2 Years of Experience)</i>	Mid-Level Architect <i>(3-5 Years of Experience)</i>	Senior Architect <i>(6-10 Years of Experience)</i>	Chief Architect <i>(10+ Years of Experience)</i>
2.1 Setting up the Program Office and Doing Projects		X	X	X
2.2 Building and Growing a Winning Architecture Team		X	X	X
2.3 Doing Architecture Work at Various Levels of Scope		X	X	X
2.4 Developing and Implementing a Stakeholder Value Scorecard		X	X	X
2.5 Selecting and Using Architecture Tools and Repositories		X	X	X
2.6 Scoping and Documenting the Current Architecture		X	X	X
2.7 Scoping and Documenting the Future Architecture		X	X	X
2.8 Developing the Architecture Management & Transition Plan		X	X	X
2.9 Using Architecture to Support Planning and Decision-Making		X	X	X
2.10 Managing Architecture Projects		X	X	X
2.11 Communicating with Stakeholders		X	X	X
2.12 Doing Program and Project Audits		X	X	X

Advanced Enterprise Architecture (Required for CEA)

Area 3 KSAs: Architecture for Mergers & Acquisitions

	Beginning Architect <i>(0-2 Years of Experience)</i>	Mid-Level Architect <i>(3-5 Years of Experience)</i>	Senior Architect <i>(6-10 Years of Experience)</i>	Chief Architect <i>(10+ Years of Experience)</i>
3.1 How Architecture Can Help in Mergers and Acquisitions		X	X	X
3.2 Architecture Contributions When Selling an Organization		X	X	X
3.3 Architecture Contributions When Acquiring an Organization		X	X	X

Architecture for Mergers and Acquisitions

3.4	Architecture Support in Cultural Evaluation/Managing Change		X	X	X	Enterprise Architect Mergers & Acquis
3.5	Architecture Support for the Due Dilligence Process		X	X	X	
3.6	Architecture Contributions to Pre-Merger Planning		X	X	X	
3.7	Architecture Contributions to Post-Merger Tactical Planning		X	X	X	
3.8	Architecture Contributions to Post-Merger Strategic Planning		X	X	X	
3.9	Architecture Contributions to Post-Merger Restructuring		X	X	X	
3.10	Reference Architectures and Organization-wide Standards		X	X	X	
3.11	Architecture with Different Organizational Structures		X	X	X	
3.12	Architecture Considerations in Evaluating Disruption Sources		X	X	X	
Area 4 KSAs: Auditing the Maturity and Value of Architecture Programs & Projects						
4.1	Overview of the EA Audit Method (EAAM)		X	X	X	Architecture Program & Project Auditing
4.2	Audit Engagement Type 1: Initial Quickview		X	X	X	
4.3	Audit Engagement Type 2: In-Depth Audit		X	X	X	
4.4	Audit Engagement Type 3: Special Focus Audit		X	X	X	
4.5	Audit Area 1: Architecture Governance		X	X	X	
4.6	Audit Area 2: Architecture Approach		X	X	X	
4.7	Audit Area 3: Documentation Completeness - Current Views		X	X	X	
4.8	Audit Area 4: Documentation Completeness - Future Views		X	X	X	
4.9	Audit Area 5: Documentation Completeness - Transition Plan		X	X	X	
4.10	Audit Area 6: Architecture Utilization		X	X	X	
4.11	Audit Area 7: Architecture Maturity		X	X	X	
4.12	Audit Reporting & Implementing Changes		X	X	X	
Area 5 KSAs: Using Architecture to Support Risk Management & Security						
5.1	The Risk Management Framework		X	X	X	Architecture for Risk Management and Security
5.2	Risk Tolearance and Control Selection		X	X	X	
5.3	Security Architecture Area 1: Governance		X	X	X	
5.4	Security Architecture Area 2: Process Controls		X	X	X	
5.5	Security Architecture Area 3: Personnel Controls		X	X	X	
5.6	Security Architecture Area 4: Data & Privacy Controls		X	X	X	
5.7	Security Architecture Area 5: Application Controls		X	X	X	
5.8	Security Architecture Area 6: System Controls		X	X	X	
5.9	Security Architecture Area 7: Infrastructure Controls		X	X	X	
5.10	Security Architecture Area 8: Physical Controls		X	X	X	
5.11	Security Architecture at the Core and Perimeter		X	X	X	
5.12	Security Architecture and Continuous Monitoring		X	X	X	
Area 6 KSAs: U.S. Federal and State Government Architecture Methods						
6.1	Overview of Governmentl Architecture Law & Policy		X	X	X	chitecture
6.2	The Common Approach to Federal EA		X	X	X	
6.3	Levels of Scope for Federal EA Activities		X	X	X	

6.4	Basic Elements of a Federal Agency EA Program		X	X	X	Federal Enterprise Ar
6.5	State-Level EA Approach		X	X	X	
6.6	Federal EA Documentation Set - Design		X	X	X	
6.7	Federal EA Reference Models - Analytics		X	X	X	
6.8	Federal EA - Collaborative Planning Method - Projects		X	X	X	
6.9	Federal EA and the NIST Risk Management Framework		X	X	X	
6.10	DOD Architecture Framework Overview		X	X	X	
6.11	GAO EA Management Maturity Framework		X	X	X	
6.12	Future Trends in Federal and State EA		X	X	X	
Area 7 KSAs: Architecture Consulting Concepts and Practices						
7.1	The Consultant as Trusted Advisor			X	X	Successful Enterprise Architecture Consulting
7.2	Packaging and Communicating Your Product			X	X	
7.3	Building and Managing the Architecture Consulting Team			X	X	
7.4	Winning and Keeping Clients in Up and Down Markets			X	X	
7.5	Requests for Proposal - Responses and Offers			X	X	
7.6	Award, Team Formation, and Project Kickoff			X	X	
7.7	Managing Project Scope and Customer Expectations			X	X	
7.8	Keeping the Customer Delighted and Handling Problems			X	X	
7.9	Seeing Around Corners for Your Client and You			X	X	
7.10	Concluding an Engagement and Team Dissolution			X	X	
7.11	Improving Your Services Through Lessons Learned			X	X	
7.12	Dealing with the Competition			X	X	
Area 8 KSAs: Big Architecture - Very Large Scale Implementations						
10.1	What is Big Architecture?			X	X	Very Large Scale Enterprise Architecture Projects
10.2	Architecting a Global Enterprise - The Approach			X	X	
10.3	Architecting a Global Enterprise - Scoping & Chunking			X	X	
10.4	Architecting a Global Enterprise - Executive & Staff Support			X	X	
10.5	Architecting a Global Enterprise - Reference Architectures			X	X	
10.6	Architecting a Global Supply Chain - Requirements & Roles			X	X	
10.7	Architecting a Global Supply Chain - Build, Buy, or Rent			X	X	
10.8	Architecting a Global Supply Chain - Risk & Security			X	X	
10.9	Architecting a Global Data Warehouse - Requirements & Roles			X	X	
10.10	Architecting a Global Data Warehouse - Standards			X	X	
10.11	Architecting a Global Date Warehouse - Build, Buy, or Rent			X	X	
10.12	Architecting a Global Data Warehouse - Risk and Security			X	X	
Area 9 KSAs: Modeling and Documentation Skill Building						
9.1	Communicating Documentation Value to Stateholders	X	X	X	X	Seminar: Artifacts
9.2	Developing Strategic Plans and SWOT Analyses	X	X	X	X	
9.3	Developing and Using Operational Scenarios	X	X	X	X	

9.4	Business Process Modeling	X	X	X	X	Architecture Modeling Analysis and Design	
9.5	Data Modeling - Entities and Objects	X	X	X	X		
9.6	Data Modeling - Warehouses and Marts	X	X	X	X		
9.7	Application Modeling - Enterprise Service Buses and APIs	X	X	X	X		
9.8	Network Modeling - Voice, Data, Video, and Mobile	X	X	X	X		
9.9	Depicting Cloud Environments and Services	X	X	X	X		
9.10	Depicting Security Control Sets and Solutions	X	X	X	X		
9.11	Developing Overview Diagrams for Management	X	X	X	X		
9.12	Using Documentation Tools and Repositories	X	X	X	X		
Area 10 KSAs: Agile Architecture for 90-Day Rapid Business Improvement							
10.1	Establishing the Scope and Goals of the RBI Project		X	X	X		Seminar: 90-Day Rapid Business Improvement
10.2	Sprint #1 - Strategic Planning and Scenarios Update		X	X	X		
10.3	Sprint #2 - Business Unit Operating Plan Updates / Scorecards		X	X	X		
10.4	Sprint #3 - Investment Portfolio Priority Update / Scorecard		X	X	X		
10.5	Spring #4 - Project Portfolio Update / Scorecard		X	X	X		
10.6	Sprint #5 - Legal Considerations and Regulatory Checks		X	X	X		
10.7	Sprint #6 - Full-Lifecycle Knowledge & Data Management		X	X	X		
10.8	Spring #7 - Flowing in New Products & Avoiding Disruptors		X	X	X		
10.9	Sprint #8 - Integrating Logistics and Supply-Chains		X	X	X		
10.10	Sprint #9 - Skills Inventory & Workforce Plan Update		X	X	X		
10.11	Sprint #10 - Contracting and Acquisition Plan Update		X	X	X		
10.12	Consolidating and Presenting RBI Project Results		X	X	X		
Area 11 KSAs: Remote Productivity Reference Architectures							
11.1	The Global Telework Phenomenon		X	X	X	Course: Remote Productivity Reference Architectures	
11.2	Management View: Productivity		X	X	X		
11.3	Employee View: Flexibility		X	X	X		
11.4	The Business Architecture		X	X	X		
11.5	The Technology Architecture		X	X	X		
11.6	Integrating Business and Technology		X	X	X		
11.7	Online Collaboration Platforms/Methods		X	X	X		
11.8	Cybersecurity and Data Privacy Issues		X	X	X		
11.9	Productivity Metrics and Dashboards		X	X	X		
11.10	Approaches to Pay and Incentives		X	X	X		
11.11	Linkage to Enterprise Architecture		X	X	X		
11.12	Ensuring Agility in Telework Processes		X	X	X		
Area 12 KSAs: IT Security and Data Privacy Architecture							
12.1	The Context of Enterprise Architecture		X	X	X	Data Privacy	
12.2	Executive-Level Value Delivery for IT Security Architecture		X	X	X		

12.3	Management-Level Value Delivery for IT Security Architecture		X	X	X	Course: IT Security and Data Architecture	
12.4	Technical Staff-Level Value Delivery for IT Security Architecture		X	X	X		
12.5	Security and Privacy Control Catalog		X	X	X		
12.6	Determining Data and System Sensitivity and Protections		X	X	X		
12.7	Cloud-Services for IT Security		X	X	X		
12.8	NIST Risk-Management Framework		X	X	X		
12.9	Incident Response Procedures		X	X	X		
12.10	System and Data Collection Approvals to Operate		X	X	X		
12.11	Cybersecurity and Data Privacy Skill Sets		X	X	X		
12.12	Future Trends in Cybersecurity and Data Privacy		X	X	X		
Area 13 KSAs: Using Artificial Intelligence in Enterprise Architecture (AI-EA)							
13.1	What is Artificial Intelligence and Machine Learning?		X	X	X		Seminar: Digitizing Work Processes
13.2	Which Areas of EA can AI Help		X	X	X		
13.3	The Need For Data Tagging of Processes, People, Assets		X	X	X		
13.4	AI Support for Strategic Goal Attainment Tracking		X	X	X		
13.5	AI Support for Tracking Goals and Business Activities		X	X	X		
13.6	AI Support for Process Automation (RPA)		X	X	X		
13.7	AI Support for Database Normalization and Migration		X	X	X		
13.8	AI Support for Systems & Software Development		X	X	X		
13.9	AI Support for Project Management		X	X	X		
13.10	AI Support for Application Programming		X	X	X		
13.11	AI Support for Infrastructure Design		X	X	X		
13.12	AI Support for Personnel Performance Tracking		X	X	X		

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