

# CEDIA Certified Designer

## Job Task Analysis (JTA) Course Guide

The CEDIA University courses noted below address multiple exam task areas. It is imperative the student use their Pre-test Assessment results to focus their study on their determined areas of weakness. This JTA will help the student to further specify their areas of weakness and choose the appropriate course of study.

Presupposed knowledge is 5+ years of experience as a Systems Designer.

ADDITIONAL RESOURCE KEY	
ESPA	Electronic Systems Professional Alliance (Training Module)
PMBOK	Project Management Book of Knowledge
TRM	Technical Reference Manual
CEA/CEDIA CEB-XX	Home Theater Recommended Practices

Domain I: Needs Assessment	Instructor Led BASIC	Instructor Led ADV	E-learning	Additional Resources
<i>Task 1: Initiate and investigate the scope of a project using a structured information gathering methodology to obtain customer information.</i>	ESD161, ESCR101, ESD360	ESD232 ESD360	ESCR101	
<b>Knowledge of:</b>				
1. Customer desires and expectations				
2. Expectations for reliability and usability				
3. Lifestyle and day-to-day use of the home				
<b>Skill in:</b>				
1. Organizing and developing the content necessary to create a formal client survey				
2. Clarifying requirements				
3. Interviewing/qualifying a client				
4. Recording pertinent information and responses accurately				
5. Determining the project stakeholders and decision maker(s)				
6. Communicating efficiently and effectively				
<i>Task 2: Assess the site conditions by reviewing architectural plans and/or visiting the site in order to pre-empt architectural and structural complications.</i>	EST101, ESD162	ESD232	ESD162	ESPATM01
<b>Knowledge of:</b>				
1. General construction methods				

2. Specialty and structural issues (i.e., equipment mounting and location, risers, etc.)				
3. Industry installation methods (e.g., wire types and routing )				
4. Local codes and regulations				
<b>Skill in:</b>				
1. Working with architectural and engineering drawings				
2. Taking accurate field measurements (e.g., tape measures)				
3. Determining spatial relationships				
4. Sketching room/existing conditions				
5. Interpreting codes, regulations, and local covenants				
6. Locating and sizing any and all project components or devices				
7. Working with software based drawing/estimating programs (e.g., CAD)				
8. Determining site conditions (i.e., distance to the site, site map and directions, site parking, existing and new construction, house layout, equipment location, unusual site conditions, and notation of existing permanent conditions)				
<i>Task 3: Establish the budget requirements by setting realistic expectations of deliverables while explaining tangible quality differences in order to deliver the optimum performance/cost balance for the systems.</i>	ESPM301	ESB225	ESB225	PMBOK
<b>Knowledge of:</b>				
1. Estimation techniques (Bottom-Up, Top-Down)				
2. Cost analysis				
3. Value engineering				
4. Time, cost, scope, and quality relationships				
5. Installation complexities and design options				
6. Life cycle costs				
7. Work Package (complete package of equipment, materials, and labor for each deliverable in the system)				
8. Work Package Dictionary (document that describes each component in the Work Breakdown Structure)				
9. Work Breakdown Structure (deliverable oriented decomposition of work to be executed)				
<b>Skill in:</b>				
1. Creating cost estimates (Bottom-Up, Top-Down, Parametric, etc.)				
2. Analyzing differences in how solution options affect the design				

3. Maintaining and referencing product databases				
4. Applying relevant mathematical calculations				
5. Identifying appropriate product(s) for each application				
6. Acquiring product knowledge				
<i>Task 4: Determine internal vs. external resource requirements for the system under design for the purpose of completing cost estimation.</i>	ESPM301, ESD162	ESB226, ESD262	ESB226, ESD162	PMBOK
<b>Knowledge of:</b>				
1. Submittal process (RFI, RFQ, RFP, etc.)				
2. Understanding terms used by associated trades				
3. Trade-off analysis, including make/buy decisions, organizational limitations, and core competencies				
4. Effective meeting techniques				
<b>Skill in:</b>				
1. Reading, interpreting, and supplying specifications				
2. Setting meetings and agendas and accurately documenting the results				
3. Using precise, measurable language				
4. Interpreting associated trades documents				
5. Defining scope of work for designated tasks				
6. Communicating the design requirements effectively (written and verbally)				
7. Decision making (i.e., make/buy decisions)				
<b>Domain II: Project Design</b>	<b>Instructor Led BASIC</b>	<b>Instructor Led ADV</b>	<b>E-learning</b>	<b>Additional Resources</b>
<i>Task 1: Create functional specifications by translating the results of the needs assessment into activity based scenarios that can be understood by all project stakeholders.</i>	ESD121, ESD162	ESD360	ESD162	TRM
<b>Knowledge of:</b>				
1. Equipment functionality and technicalities				
2. Cognitive principles and ergonomics				
3. Designing behaviors that support the personal goals of the users				
<b>Skill in:</b>				
1. Describing the sequence of product touch points				

2. Creating documents that communicate sequential behaviors and interdependences (i.e., flowcharts)				
3. Writing scenario narratives				
4. Establishing performance levels				
<p><i>Task 2: Create physical specifications by translating the results of the functional specifications into system requirements.</i></p>	EST105, EST243, EST253, ESD121, ESD131, ESD151, ESD242, ESD360	EST320, EST333, ESD211, ESD223, ESD232, ESD301, ESD302, ESD303, ESD323, ESD324, ESD325, ESD327, ESD332, ESD341, ESD431	ESD301, ESD302, ESD303, ESD325, ESD327	TRM  Middle Atlantic White Papers,  CEDIA HDMI White Papers,  CEA/CEDIA CEB-22, CEB-23, CEB-24
<b>Knowledge of:</b>				
1. Home Theater (i.e., surround formats, aspect ratio, screens)				
2. Acoustics				
3. Audio (i.e., software-defined radio, XM/Sirius)				
4. Video topics (i.e., formats, resolution, content protection, xvYCC, video storage, digital imaging, ATSC, video conferencing, IPTV, display technologies, HD DVD, Blu-ray, DBS)				
5. Cabling standards (i.e., MDUs, CEA 2030, TIA 570-B, NEC, backbone, HDMI, DVI, fiber optics)				
6. Communications (i.e., podcasts, VOIP, social networking, cell phones, PBX, voicemail)				
7. Networking (i.e., Web 2.0, WiMax, WiMedia, 802.x, mesh networks, ZigBee, 1394, USB, LAN, WAN, PAN, MAN, bluetooth, TCP/IP, UDP, UpNP, XML, DLNA, HPNA, MoCA, HomeRF, HomePlug)				
8. Interactive media spaces (i.e., gaming, virtual reality, AI, telepresence)				
9. Home automation (gates, shades, motorization, gas/electric fires, spa and pool control, irrigation, etc.)				
10. Media servers (i.e., DVR, content management, A/V Codecs)				

11. Robotics
12. Digital rights management
13. Equipment mounting (i.e., racks, thermal management)
14. Power management (i.e., power conditioning, grounding, bonding, green technology, energy management)
15. Digital home health
16. Relevant safety regulations
17. Control systems, including user interface design (i.e., RS232, RS422, RS485, LonWorks, CEBus, EIA 600, DALI)
18. User interface (i.e., ambient devices, search engines, gesture recognitions, haptics, biometrics)
19. Security and fire alarm systems, knowledge of regulations and integration of same (i.e., access control, monitoring, DVRs)
20. Lighting design and control
21. HVAC basic print system control (but not how to design HVAC systems)
22. Architecture (millwork, structural, finish work, etc.)
23. Central vacuum systems control and integration of same
24. RF/CATV/DSS/CCTV distribution systems and HD and digital signal distribution
25. Basic electronics (e.g., Ohm's law, etc.)
26. Design programs and other computer applications
27. Manufacturing and product specifications
28. Technology trends
<b>Skill in:</b>
1. Considering future design expansions
2. Reading and interpreting product specifications
3. Documenting system specifications
4. Identifying applicable technologies
5. Performing system related calculations
6. Evaluating and choosing products
7. Calculating heat, electrical, and structural loads
8. Determining ventilation requirements (CFM, pathways, penetrations, etc.)
9. Designing and balancing audio/video distribution
10. Specifying, calculating, and analyzing acoustic design
11. Specifying spatial/mechanical/mounting/installation methods

12. Establishing performance levels				
13. Determining functionality and programming requirements				
14. Designing for serviceability, usability, and reliability				
<i>Task 3: Define the programming specification from the functional specification in order to determine what is to be controlled, the method and complexity of control, and the operational parameters including scripts, zone maps, and input/output relationships for the full integration of the system.</i>	ESD121, EST262	ESD327	ESD327	
<b>Knowledge of:</b>				
1. Product functionality and configuration variables				
2. Operational requirements				
3. Method and complexity of control				
4. Structured programming				
5. Programming languages and development				
6. Boolean logic and truth tables				
7. Flowcharts, state diagrams, and macros				
8. Interface protocols (i.e., RS232, RS485, TCP/IP, IR, digital I/O, etc.)				
9. Pseudocode and conditional logic				
<b>Skill in:</b>				
1. Describing sequential events				
2. Specifying I/O relationships between events and actions				
3. Determining fault scenarios, backup, and error recovery (i.e., reboot)				
4. Reading and interpreting product manuals				
<i>Task 4: Create the user interface specification by proposing physical control arrangements in order to provide control consistent with client needs.</i>	ESD121, EST262	ESD327	ESD327	
<b>Knowledge of:</b>				
1. Ergonomics, aesthetics, and human factors				
2. User interface options and applications				
3. Graphic design basics				
4. Web based control systems				
5. Hierarchical methods of control				
6. Metaphors				
7. Limitations of user interfaces				
8. Defaults				
9. Usability testing				

<b>Skill in:</b>				
1. Communicating ideas, concepts, and necessities				
2. Choosing the appropriate physical control device				
3. Evaluating the user interface designs through usability testing				
4. Basic drawing (i.e., paper and pencil)				
<i>Task 5: Direct the creation and evaluation of prototypes and/or working mock-ups to ensure design requirements.</i>		ESD262, ESD423, ESD424		
<b>Knowledge of:</b>				
1. Equipment space and load bearing requirements				
2. Equipment power requirements				
3. Equipment ventilation requirements				
4. Equipment control requirements				
5. Design, test, and evaluation process				
6. Function and limitations of the prototype and/or mock-ups				
7. Performance requirements				
8. Test equipment				
<b>Skill in:</b>				
1. Sketching design ideas				
2. Operating basic test equipment				
3. Documenting the test outcome and/or sample evaluation and obtaining signoff				
4. Researching changes in codes, regulations, and standards				
5. Testing the validity of new technologies in the design				
<b>Domain III: Design Documentation</b>	<b>Instructor Led BASIC</b>	<b>Instructor Led ADV</b>	<b>E-learning</b>	<b>Additional Resources</b>
<i>Task 1: Create a proposal (bill of material, resource list, and labor products) based on the cost estimate by generating appropriate documentation in order to communicate the requirements of the project.</i>	ESD122, ESD124, ESD162	ESCR312	ESD162	
<b>Knowledge of:</b>				
1. General knowledge of all trades, sub contractors, and other design professionals and their responsibilities				
2. Relevant product knowledge				
3. Component interconnection and interaction				
4. Subsystem interconnection and interaction				
<b>Skill in:</b>				

1. Communicating efficiently and effectively				
2. Generating equipment, parts, and materials details				
3. Describing assemblies and sub-assemblies				
<i>Task 2: Generate electronic system plans for distribution to relevant parties by preparing or modifying architectural plans in order to determine the location of devices and wire routes, including installation and construction notes.</i>	ESD111, ESD122, ESD124, ESD162, EST101		ESD162	ESPATM01, ESPATM05
<b>Knowledge of:</b>				
1. Accepted building codes (local, national, OSHA, NEC, ADA, ICBO, UBC)				
2. Drawing legends, symbol/icon definition, and usage				
3. Fundamental ergonomics				
4. Product placement criteria				
5. Serviceability and usability				
6. Drawing layers				
7. Installation guidelines and criteria				
8. Document revision control				
9. Interior design (i.e., aesthetic considerations, furniture layout)				
10. Site considerations				
11. Traffic patterns				
<b>Skill in:</b>				
1. Reading drawings				
2. Annotating drawings				
3. Interpreting installation guidelines and criteria				
4. Creating the facilities plan drawings				
5. Product placement (i.e., user interfaces, components, equipment mounting, speaker layout, etc.)				
<i>Task 3: Create cable documentation (i.e., cabling plan and schedule) by describing the origin, destination, and type of each wire along with associated devices for distribution to associated trades.</i>	ESD162, EST101	ESD211	ESD162	ESPATM01, Middle Atlantic White Papers, CEA/CEDIA CEB-22, CEB-23, CEB-24

<b>Knowledge of:</b>				
1.Cable types, outlets/inlets, connectors, back boxes				
2.Connection of all sub-systems				
3.Signal types				
4.Cable characteristics				
5.Trades involved				
6.Local codes, re gulations, and standards				
7.Wire management practices				
<b>Skill in:</b>				
1.Using electrical formulas to calculate wire specifications				
2.Specifying appropriate cable types (i.e., fire ratings, class, shielding, etc.)				
3.Specifying connectors and connectorization				
<i>Task 4: Generate block diagram (single-line drawing) by showing basic system level interconnection between components and sub-systems in order to troubleshoot and illustrate signal flow and functionality.</i>	ESD162	EST320	ESD162	
<b>Knowledge of:</b>				
1.Concepts of signal flow and control nomenclature				
2.Flow charts in order to create block diagrams				
3.Components used in system				
4.Cables and terminations				
<b>Skill in:</b>				
1. Generating block diagrams				
2. Appropriate drawing/drafting skills				
3. Organizing layout and annotating for clarity of presentation				
4. Creating a symbolic representation of components and devices				
<i>Task 5: Generate point-to-point wiring diagram by describing the specific input-output, wire and connector types, and method of interconnection in order to document how the components will be connected.</i>	ESD162	EST320	ESD162	
<b>Knowledge of:</b>				
1. Concepts of signal flow and control nomenclature				
2. Components used in system				
3. Cables, connectors, pinouts, terminations, and color codes				
4. Back-panel layout of all devices in the system				

5. Basic point-to-point information including symbols, grounding, voltage requirements, and other safety related information				
<b>Skill in:</b>				
1. Generating point-to-point drawings				
2. Referencing point-to-point to wiring schedule				
3. Applying electrical and safety codes				
4. Organizing layout and annotating for clarity of presentation				
5. Detailing cable connector, pinouts, terminations, and color code requirements				
6. Defining drawing layers (e.g., audio, video, control, RF, power, etc)				
<i>Task 6: Compile as-built drawings and Operations/Maintenance manuals by updating all post-installation construction documents.</i>	ESD162	EST320, ESD262	ESD162	
<b>Knowledge of:</b>				
1. Red-lining techniques				
2. Change orders				
3. Project history				
<b>Skill in:</b>				
1. Creating and managing archive files				
2. Reading construction documents				
3. Version control				
4. Recording setup parameters				
<i>Task 7: Prepare test specifications to verify system performance and functionality.</i>		EST407	EST407	
<b>Knowledge of:</b>				
1. Functions and limitations of test equipment				
2. Process of evaluating entire system				
3. Thorough understanding of the finished project				
4. Setup parameters and performance specifications				
<b>Skill in:</b>				
1. Verifying that the design principles were satisfied				
2. Creating a quality control and assurance checklist				
3. Making qualitative assessments and inspections				
4. Preparing test reports				
5. Interpreting the results of the tests				

Domain IV: Design Management	Instructor Led BASIC	Instructor Led ADV	E-learning	Additional Resources
<i>Task 1: Assess the impact of change orders on the overall design.</i>	EST101, ESD162	ESB226	ESB226, ESD162	PMBOK, ESPATM01
<b>Knowledge of:</b>				
1. Technical limitations of all associated equipment within the system				
2. Comprehensive understanding of original design intent				
3. Comprehensive understanding of original design intent				
4. Impact of industry factors (i.e., new technologies, back orders, codes and standards, etc.)				
5. Impact of organizational factors (i.e., internal vs. external resources, etc.)				
6. Impact of customer factors (i.e., color preference, budget)				
<b>Skill in:</b>				
1. Recalculating budget costs				
2. Analyzing how different solution options affect the design				
3. Consulting with clients, installers, and other design professionals				
4. Recalculating resource requirements for impacted work packages				
<i>Task 2: Monitor progress of the project to ensure design compliance.</i>	ESPM301, ESD162		ESD162	PMBOK
<b>Knowledge of:</b>				
1. Assigned responsibilities of the contractors and sub-contractors				
2. Existence of key project milestones				
3. Communication plan				
4. Original design intentions				
<b>Skill in:</b>				
1. Documenting progress				
2. Inspecting installation progress by conducting periodic site visits				
3. Initiating periodic status reports				
4. Maintaining communication log				
5. Generating, reviewing, and approving submittals				