

Appendix A: CTS Exam Content Outline

The CTS exam specifications were developed by combining the importance, criticality, and frequency data obtained from the Job Task Analysis study conducted in 2012. The resulting data were converted to percentages and the percentages were used to determine the number of questions related to each domain and task that should appear on the multiple-choice CTS examination. The test specifications in the table below list how many questions are included in each Domain and Task and the percentage of the test included in each domain. The Job Task Analysis Final Report can be downloaded at www.AVIXA.org/cts under "CTS Resources".

Domains/Tasks	% of Exam	# of Items
Domain A: Creating AV Solutions	61%	61
Task 1: Conduct site survey	6%	6
Task 2: Gather customer information	6%	6
Task 3: Evaluate site environment (acoustics, lighting, seating, finishing, etc.)	6%	6
Task 4: Maintain awareness of changes to the site environment (acoustics, lighting, seating, finishing, etc.)	6%	6
Task 5: Develop a functional AV scope	8%	8
Task 6: Design AV solutions	12%	12
Task 7: Sell AV solutions	5%	5
Task 8: Conduct vendor selection process	4%	4
Task 9: Provide AV solutions	8%	8
Domain B: Operating AV Solutions	16%	16
Task 1: Operate AV solutions	6%	6
Task 2: Conduct maintenance activities	5%	5
Task 3: Manage AV solutions/operations	5%	5
Domain C: Conducting AV Management Activities	11%	11
Task 1: Project Manage AV projects	5%	5
Task 2: Perform AV Finance and Job Costing Activities	6%	6
Domain D: Servicing AV Solutions	12%	12
Task 1: Troubleshoot AV solutions	7%	7
Task 2: Repair AV solutions	5%	5
Total	100%	100

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CTS Examination: Job Task Analysis

A detailed job task analysis is available on the CTS Exam Resource page of AVIXA's website. Visit www.AVIXA.org/cts

Domain A: Creating AV Solutions

Task 1: Conduct site survey

Knowledge of:

- Conversions (metric system, etc.)
- Questioning techniques
- Health and safety regulations
- Use of Personal Protective Equipment (PPE)
- Site-specific safety requirements
- Observing and documenting site conditions

Skill In:

- Calculating areas and volumes
- Communicating concisely
- Measuring
- Reading blueprints
- Recording data
- Basic math
- Listening techniques
- Observational techniques
- Written communications
- Reading plans and blueprints

Domain A: Creating AV Solutions

Task 2: Gather customer information

Knowledge of:

- Customer service techniques
- Negotiation techniques
- Scale drawings

Skill In:

- Basic math
- Listening techniques

Domain A: Creating AV Solutions

Task 3: Evaluate site environment (acoustics, lighting, seating, finishing, etc.)

Knowledge of:

- Customer service
- Scale interpretations
- Advanced math (algebra, logarithms, geometry, trigonometry)
- Health and safety regulations
- Material Safety Data Sheets (MSDS)
- PPE
- Site-specific safety requirements
- Scale drawings
- Space acoustics
- Sight lines
- Ambient and artificial lighting
- Furniture and furniture layouts

Skill In:

- Basic reading
- Written communication

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- Room finishes (materials, colors, etc.)
- Services (power, data, cable access, HVAC, ICT, etc.)
- Historical and heritage considerations
- Zoning and planning considerations
- Building regulations (Code) considerations
- Space plans

Domain A: Creating AV Solutions

Task 4: Maintain awareness of changes to site environment (acoustics, lighting, seating, finishing, etc.)

Knowledge of:

- Customer service
- Scale interpretations and scale drawings
- Space acoustic treatments
- Changes to sight lines
- Ambient and artificial lighting
- Management of lighting
- Furniture room finishes (materials, colors, etc.)
- Services (power, data, cable access, HVAC, ICT, etc.)
- Substructure (walls, ceiling height, etc.)
- Structure (hanging points, wall supports, etc.)
- Historical and heritage considerations
- Zoning and planning considerations
- Building regulations (Code) considerations
- Space planning solutions

Skill in:

- Basic reading
- Written communication
- Advanced math skills- algebra, logarithms, geometry, trigonometry

Domain A: Creating AV Solutions

Task 5: Develop a functional AV scope

Knowledge of:

- Compiling customer and site information
- Presenting findings to customers
- Financial calculations
- Technical writing

Skill in:

- Interpersonal communication
- Conducting presentations
- Written communications
- Drawing and sketching

Domain A: Creating AV Solutions

Task 6: Design AV solutions

Knowledge of:

- AV solution components
- Developing block diagrams
- Creating specifications and drawings
- Creating a bill of materials (BOM)
- Calculating heat generation
- Calculating light levels
- Calculating power consumptions
- Calculating room layouts
- Calculating sound levels
- Conducting equipment needs calculations (projector lumens, amplifier wattage, speaker taps, screen gain/size, etc.)
- Basic drafting
- Technical writing

Skill in:

- Basic and advanced math
- Customer relationships
- Presentations
- Written communications
- Measuring distances and scaling

Domain A: Creating AV Solutions

Task 7: Sell AV solutions

Knowledge of:

- Developing and presenting a proposal
- Obtaining customer feedback
- Negotiating an AV contract
- Creating maintenance contracts
- Customer service
- Training techniques

Skill in:

- Interpersonal communications
- Listening
- Negotiation
- Presentation
- Sales
- Verbal communication
- Written communication

Domain A: Creating AV Solutions

Task 8: Conduct vendor selection process

Knowledge of:

- Reviewing proposals submitted by others
- Seeking clarification for vendors and providing feedback to vendors
- Calculating heat generation
- Calculating light levels
- Calculating power consumptions
- Calculate room layouts
- Calculating sound levels
- Conducting equipment needs calculations (projector lumens, amplifier wattage, speaker taps, screen gain/size, etc.)

Skill in:

- Basic and advanced math
- Basic reading
- Interpersonal communication
- Interviewing techniques
- Presentation
- Written communication

- Design calculations
- Financial calculations

Domain A: Creating AV Solutions

Task 9: Provide AV solutions

Knowledge of:

- Developing content
- Installing and setting up equipment
- Manufacturing equipment
- Developing designs and specifications
- Programming AV equipment
- Configuring network systems
- Configuring AV equipment
- Designing user interfaces
- Producing user interfaces
- Commissioning systems
- Creating documentation (user manuals, maintenance reports, etc.)
- Training users
- Producing AV events
- Measuring
- Cable management
- Soldering
- Pulling cables and wires
- Basic carpentry
- Affixing anchors
- Cutting and drilling structures
- Sawing wood
- Terminating
- Threading
- Grounding (Earthing)
- Labeling
- Rack dressing
- Networking
- Testing methods
- Electrical safety
- Fall prevention and protection
- Health and safety regulations
- Ladder, scaffolding, and powered lift safety
- Materials handling
- PPE
- Site-specific safety requirements
- Installation techniques

Skill in:

- Basic reading
- Listening
- Written communication
- Scheduling

Domain B: Operating AV Solutions

Task 1: Operate AV solutions

Knowledge of:

- Proper equipment operation
- Daily preventative maintenance techniques
- Conducting solution shut-down activities
- Completing documentation (daily logs, etc.)
- Customer service
- Materials handling safety
- Health and safety regulations
- Lifting safety
- Material safety data sheets (MSDS)
- Site specific safety requirements
- Safety associated with working at heights

Skill in:

- Interpersonal communication
- Listening
- Presenting
- Verbal communication
- Written communication

Domain B: Operating AV Solutions

Task 2: Conduct maintenance activities

Knowledge of:

- Maintaining AV solutions
- Preventative and first-line maintenance of equipment (lamp life, filters, consumables, etc.)
- Conducting solution check-outs
- Testing and certifying leads and equipment
- Documenting maintenance results
- Cable management
- Calibrating systems and equipment
- Customer service
- Grounding
- Labeling
- Rack dressing
- Testing methods
- Electrical safety
- Networking
- Health and safety regulations
- High voltage safety
- Ladder safety
- PPE

Skill in:

- Basic reading
- Interpersonal communication
- Listening
- Verbal communications
- Written communications
- Affixing anchors
- Pulling wires and cables
- Soldering
- Terminating
- Threading

Domain B: Operating AV Solutions

Task 3: Manage AV solutions/operations

Knowledge of:

- Liaising with third-party users and stakeholders
- Ensuring the security of equipment
- Monitoring usage and availability of solutions
- Scheduling usage of solutions
- Managing stock and material levels
- Conducting customer service activities
- Liaising with vendors and suppliers
- Conducting training
- Maintaining professional skills and knowledge
- Conducting administrative work (billing, purchasing, documentations, recording, etc.)
- Conducting strategy planning (long and short term)
- Conducting basic troubleshooting
- Coordinating maintenance and service
- Calculating profit and loss
- Estimating
- Financial calculations
- Utilization calculations
- Fire safety practices
- Life safety issues
- Public safety issues
- PPE

Skill in:

- Interpersonal communication skills
- Calculating stock levels
- Presentations
- Scheduling
- Verbal communications
- Written communications

Domain C: Conducting AV Management Activities

Task 1: Project manage AV projects

Knowledge of:

- Producing project documentation (Gantt charts, timelines, progress reports, etc.)
- Managing changes (Request for Information [RFI], change orders/variation orders [CO/VO], etc.)
- Coordinating site activities (between contractors, etc.)
- Reviewing project documentation
- Coordinating resources (vans, labor, tools, etc.)
- Ensuring health and safety per local regulations/codes

Skill in:

- Basic math
- Conflict resolution
- Interpersonal communication
- Listening
- Verbal communication
- Written communication
- Scheduling

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- Project meetings
- Managing project activities according to a schedule
- Ensuring project budgets are met
- Obtaining customer confirmations (sign-offs, documentation, etc.)
- Conducting job costing activities
- Maintaining vendor/supplier relationships
- Customer service

Domain C: Conducting AV Management Activities

Task 2: Perform AV finance and job costing activities

Knowledge of:

- Identifying and calculating quantities (equipment, materials, services, content, tools, and labor)
- Producing lists (equipment, materials, services, content, tools and labor)
- Estimating AV costs (equipment, materials, services, content, tools and labor)
- Estimating other project costs (fees, permits, bonds, financial costs, insurance, travel, etc.)
- Gathering field reports and time sheets
- Producing estimates
- Reviewing estimates, purchase orders and proposals
- Identifying vendors and suppliers
- Confirming pricing and equipment lead time
- Alternative AV equipment, materials and resources for jobs.
- Analyzing project expenses
- Analyzing utilization rates
- Evaluating job progress
- Producing progress/stage/interim invoices
- Creating project profit and loss documents
- Purchasing techniques (equipment, materials, services, content, tools and labor)
- Vendor relationship techniques
- Negotiation techniques
- Calculating conduit
- Calculating labor utilization
- Basic accounting
- Calculations of margins, percentages and mark-ups
- Manpower calculations

Skill in:

- Basic and financial math
- Interpersonal, verbal and written communication
- Conflict resolution
- Presentation skills
- Entering data

Domain D: Servicing AV Solutions

Task 1: Troubleshoot AV solutions

Knowledge of:

- Warranty and maintenance agreements
- Project documentation (operational manuals, drawings, source code, etc.)
- Inspection techniques (visual, etc.)
- Developing troubleshooting strategies (methods and steps)
- Performing diagnostics
- Recreating and confirming problem symptoms
- Corrective actions (repairs, replacements, removals, etc.)
- Calculating throw distances
- Measuring signal levels
- Customer relationship skills
- Documentation techniques
- Fabrication
- Negotiation techniques
- Aligning a projector
- Calibrating color balance
- Calibrating test meters
- Basic carpentry
- Terminating
- Installation techniques

Skill in:

- Basic reading
- Conflict resolution
- Interpersonal, verbal and written communication skills
- Listening

Domain D: Servicing AV Solutions

Task 2: Repair AV solutions

Knowledge of:

- Corrective actions
- Documenting problems and resolutions (maintenance logs, materials, time, travel, billables, etc.)
- Ohm's Law
- Calculating throw distances
- Measuring signal levels
- Reading technical drawings
- Conflict resolution techniques
- Fabrication
- Documentation
- Voltage calculations

Skill in:

- Basic math
- Basic reading
- Documenting
- Interpersonal, verbal and written communication skills
- Listening
- Negotiation