

LACCD	Orig. Date: 01.29.10	Control No.: ITSTD-2010-01-SC
INFORMATION TECHNOLOGY STANDARD		
Title: SMART CLASSROOM	Rev. Date:	Rev. No.: R0
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I. PURPOSE OF TECHNOLOGY STANDARDS

The District provides education programs to the community that meet the changing needs of students for academic and occupational preparation. Providing robust, sustainable technology systems at each of the nine colleges will enhance these educational programs. This IT standard is meant to provide minimums and guidelines for the design, construction and renovation of Smart Classrooms at the Los Angeles Community College District (LACCD) including, but not limited to, East Los Angeles College (ELAC), Los Angeles City College (LACC), Los Angeles Harbor College (LAHC), Los Angeles Mission College (LAMC), Los Angeles Pierce College (LAPC), Los Angeles Southwest College (LASC), Los Angeles Trade Tech College (LATTTC), Los Angeles Valley College (LAVC), West Los Angeles College (WLAC), and the Los Angeles City College District Office, collectively LACCD, satellite campuses and select facilities.

The goal is to provide simple and intuitive systems for teaching and collaboration with tools for video, audio and recording. Design an environment where classrooms are standardized to provide consistent learning environments and that are adequately maintained and supported for optimum operation and maximum utilization. The intent is for the instructors to be immediately familiar with the layout of audiovisual equipment and how to control the system, regardless of which multi-media space they happen to be assigned to, so that they can focus on the business of educating rather than spending valuable time trying to understand how to use the technology.

II. SCOPE

The Smart Classroom Standard applies to all LACCD classrooms. This is intended for use in all new construction or for renovation projects which revamp existing classroom space throughout the LACCD. These guidelines will standardize minimum performance of Smart Classroom technologies and functions throughout the district. The standard will provide parameters regarding LACCD requirements for classrooms, but will require interpretation and adjustment to suit the specific situations presented by instructional and academic needs across the district. General classroom types shall accommodate the academic needs of a variety of disciplines, departments, and programs while maintaining common technology types and standard interfaces to promote the ease of use for faculty as they transition classrooms across the LACCD. All guidelines within this Smart Classroom Standard will be consistent with approved LACCD Technology Standards.

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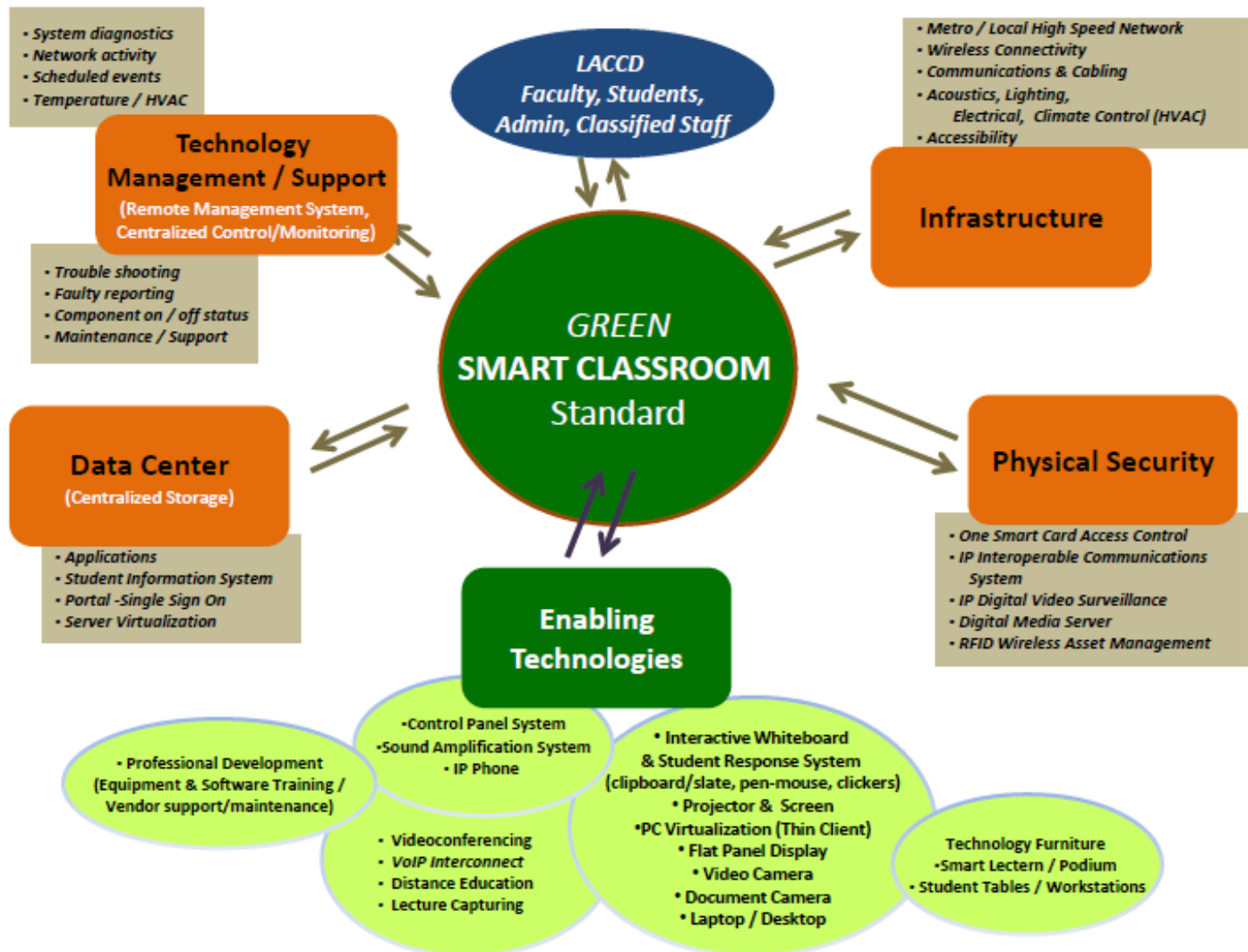


Figure 1: Green Smart Classroom Standard

The figure above illustrates the relationships of the infrastructure, physical security, technology management/support, and data center working with the enabling technologies involved in the design and support of all Smart Classrooms throughout LACCD.

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III. STANDARDS

Key Terms

- **Must** means that the item or course of action is absolutely required.
- **Shall** means that the District intends that the supplier or consultant adhere to the instruction or command.
- **Will** means that the existing District systems or conditions require the item or course of action.
- **Optional** means that the consultant may choose to include or omit a particular item according to its preference. However, the item chosen must still interoperate or function with the District's existing systems.
- **Minimum of** means that the stated item or course of action meets the standard but may be superseded.

General Requirements

- **Infrastructure**
All smart classrooms should have the infrastructure capability to be equipped for AV technologies mentioned in this document.
- **Communications Outlets**
Communications outlets are to be installed in the Smart Classroom locations in compliance with applicable LACCD standards.
- **Acoustics**
Smart Classroom acoustics must meet with applicable LACCD standards.
- **Electrical**
Smart Classroom electrical design must meet with applicable LACCD standards.
- **Climate Control / HVAC**
Smart Classroom electrical design must meet with applicable LACCD standards.
- **Lighting**
Smart Classroom lighting design must meet with applicable LACCD standards.

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- **Accessibility (ADA)**
Smart Classroom enabling technologies must comply with the Americans with Disabilities Act (ADA).
- **Data Center (Centralized Storage)**
Smart Classroom data will be stored in centralized storage. Refer to applicable LACCD standards.
- **Remote Management System (Centralized Control & Monitoring)**
Each Smart Classroom AV system will be connected to the campus network via a network connection. Refer to applicable LACCD standards.
- **Applications**
Smart Classrooms should have applications that comply with applicable LACCD standards.
- **Physical Security**
Smart Classroom physical security must meet with applicable LACCD standards.
- **Green Guidelines**
All Smart Classroom equipment must meet LEED requirements. LEED certification stands for Leadership in Energy and Environmental Design which is a national rating system developed by the U.S. Green Buildings Council to provide a benchmark for design, construction and operation of green buildings

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Smart Classroom – Traditional Technology

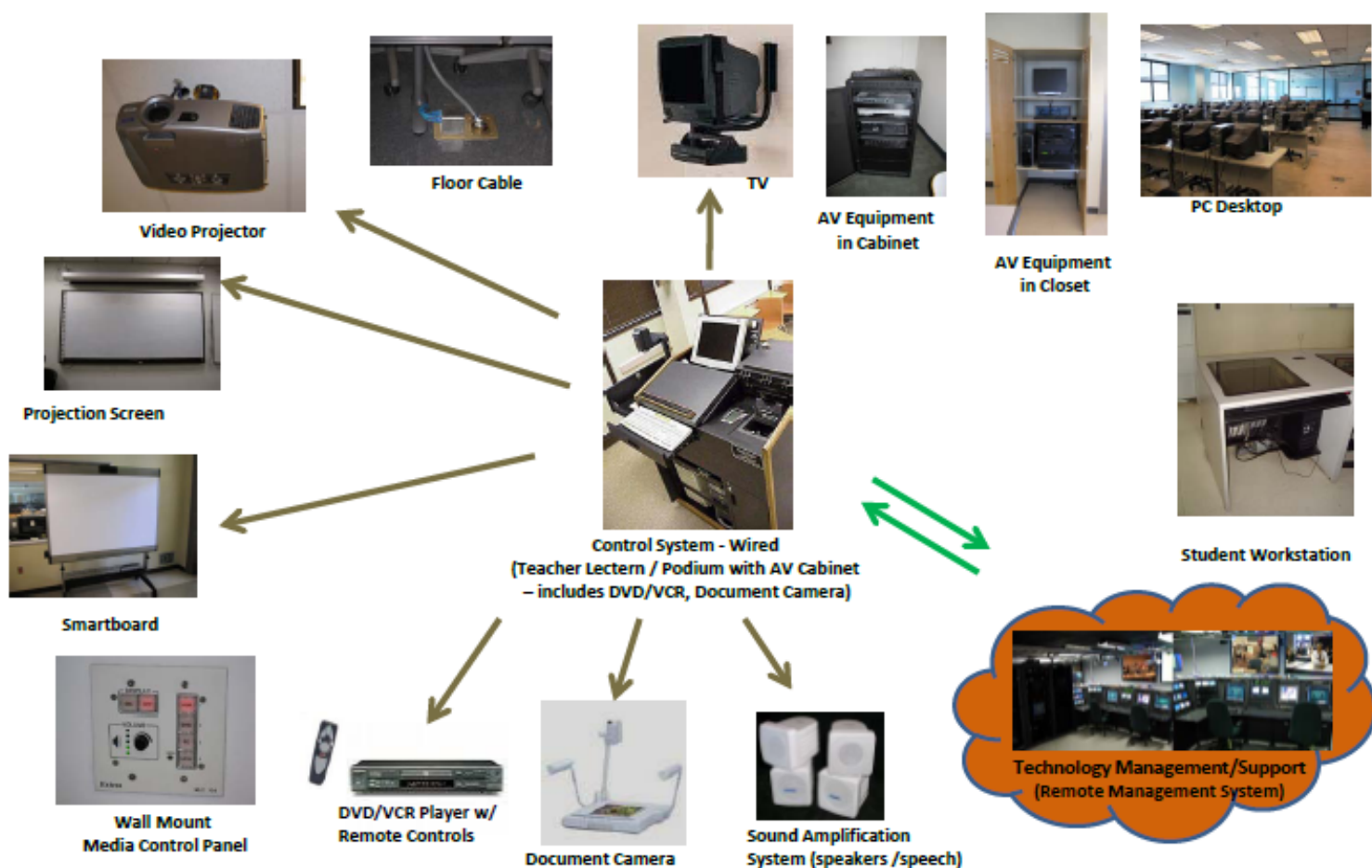


Figure 2: Smart Classroom – Traditional Technology

The figure above illustrates what traditional technologies are currently in place at most LACCD campuses. Currently, the control system does not control and monitor all technologies.

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Smart Classroom – New & Emerging Technology

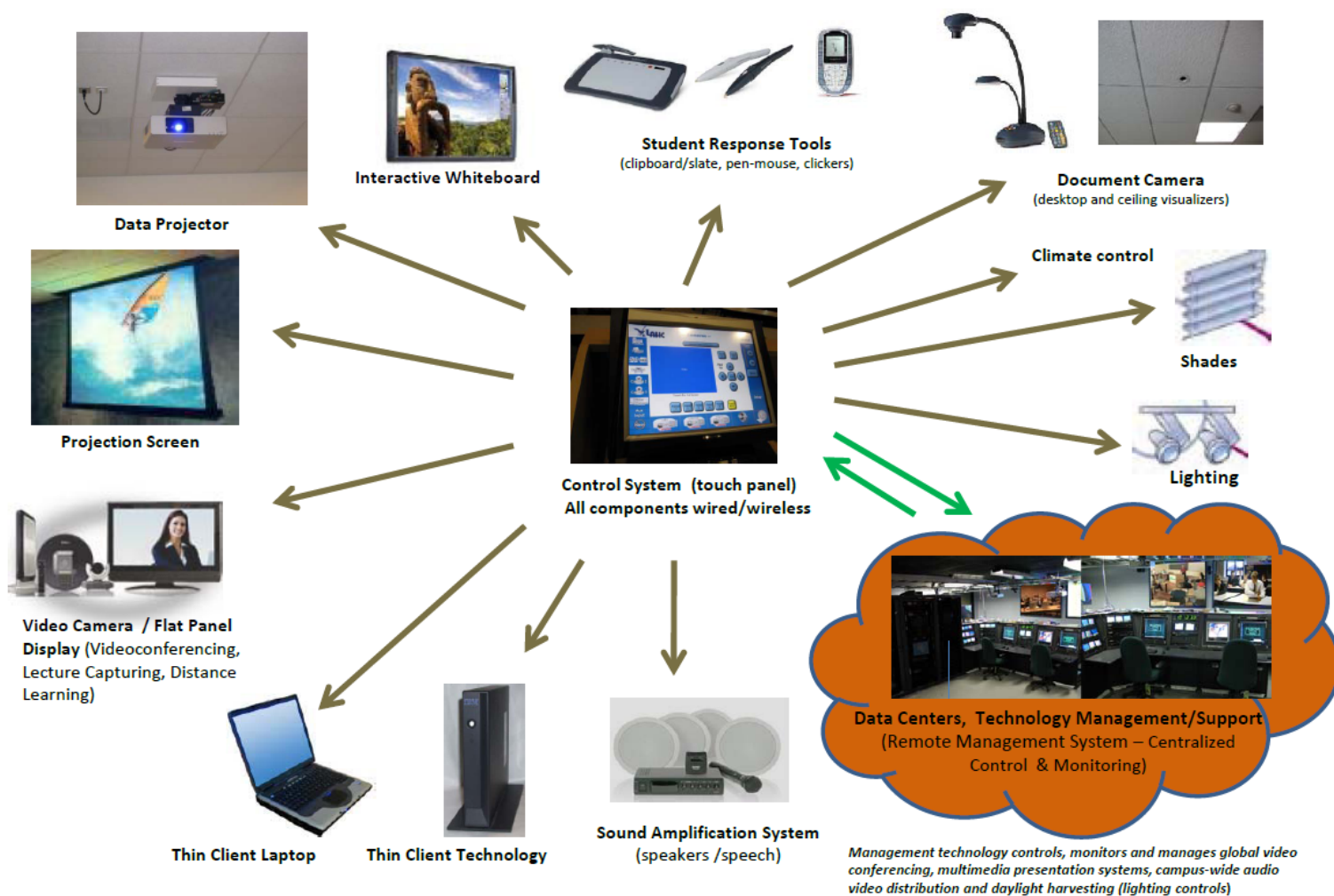


Figure 3: Smart Classroom – New and Emerging Technology

The figure above illustrates the LACCD's goal of this standard – the ability for instructor to control the technologies in the classroom, and the ability for the Technology Management/Support to control, monitor and manage all Smart Classroom technologies throughout the District.

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1. Section 1: Enabling Technologies

1.1 Control Panel System



The control system shall be touch screen panel that allows instructor to control and perform multiple functions such as system power on/on, lighting, audio/video source selection, and volume control of audio system. The control equipment shall be IP-enable with the ability to be controlled remotely such that a central location can monitor all aspects of operations and maintenance. It should be a simple and intuitive system, consistent throughout all campuses. Refer to applicable LACCD Control Panel System Standard for more information.

1.2 Sound Amplification System (Audio Reproduction)



The Smart Classroom sound amplification system should be loud enough for the particular application, and be intelligible. It must be stable and not prone to feedback. Design speech reinforcement system design should provide the audience members in the least favored listening positions (i.e., the farthest from the talker) with the same listening experience as the audience members close to the talker. Location of speakers shall be based on purpose of the room. Consider speakers to be recessed in walls. Wireless microphones shall be provided for the instructor. Consider full range loudspeakers that cover speech and music frequency range. Single units are acceptable.

The ALS shall fully comply with the latest 508 Compliance requirements. Refer to LACCD Sound

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Amplification System Standard for more information.

1.3 Interactive Whiteboard



The Smart Classroom shall have an interactive whiteboard that have a touch system that integrates all interactive learning components in the classroom into one user-friendly platform: projector, multi-media system, and software. It shall allow connection via online for library of editable templates, flipcharts, ready-made lessons, best practices, and resources. It shall have a surface that can be poked, touched or leant upon without disturbing the lesson or damaging the board. It must have the following capabilities such as: manipulating text and images, taking notes in digital ink, saving notes for review via e-mail, the Web or print, showing and writing notes over educational video clips, and showcasing student presentations. See LACCD Interactive Whiteboard Standard for more information.

1.3.1 Response Systems - Clipboard / Slate with Stylus



The instructor must be able to use a clipboard / slate with stylus with the interactive whiteboard. The clipboard/slate must allow instructor to create and deliver lessons from anywhere in the classroom. It must enable the instructor to move around the classroom, controlling the lesson from anywhere in the classroom – making any learning environment versatile. Also, it must enable students to fully interact without moving from their seats. Instructors must be able to move about and connect with students, and everyone is able to participate.

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1.3.2 Response Systems - Clicker, cell phone



1.3.2.1 Clicker

The student should be able to use a clicker with the interactive whiteboard. The clicker must be an easy to use tool, hand-held device for polling, debates and pre-planned participatory exercises alike, ready to query the class at any time. The hand-held tool shall offer instructors the opportunity to instantly gauge student comprehension and adjust lesson plans based on needs. System must have capability to download learner results into spreadsheets and lesson plans for clear achievement records over time. The clicker must also work with 3rd party interactive whiteboards

1.3.2.2 Cell phone

The student should be able to use their cell phone as a response system with the interactive whiteboard.

1.4 Data Projectors



Each smart classroom will feature digital and high-resolution data projector with wireless capability will allow instructors to carry a laptop or tablet computer around the room and display its contents on the screen rather than being confined to the lectern location if desired. The projector will display images on ceiling mounted projection screen in the front of the room. The projector will be capable of both wired and wireless

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communication that will display content from high-resolution source devices (HDMI) such as laptop / tablet computers or video content provided in each room. Dependent on room size, multiple projectors may be considered.

1.5 Projectors Screen



Projection screens shall be sized to accommodate good viewing at student seat locations. Dependent on room size and purpose, multiple screens and/or size must be considered. The aspect ratio or format should be consistent throughout college. It shall be ceiling mounted and motorized with a manual switch located near the instructor station.

Optional: Use of commercial-grade paint, that cost effectively, turns any smooth surface into a high-performance dry-erase writing surface, like Idea Paint, in lieu of projection screen (combination of whiteboard and projection screen) may be considered.

1.6 Camera System (for Videoconferencing, Lecture Capturing, Distance Learning)



Expand the current use deployment of HD videoconferencing to classrooms that enable sharing across campuses, remote teaching, and desktop videoconferencing. Access ensures that professors and students are fully engaged and have complete access to the curriculum from anywhere. All colleges are able to communicate face-to-face to share

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content and connect to each other, for unlimited programs with corporations, cultural institutions, science centers, and other knowledge centers. Dependent on room size, multiple video cameras may be considered.

1.7 Document Camera



Document cameras are real-time image capture devices for displaying an object to a classroom. They shall be high-resolution cameras that allows instructor to write on a sheet of paper or to display a two or three-dimensional object while the audience watches. Document cameras are typically connected to video projectors or interactive whiteboard. High-definition document cameras shall include an HDMI output port.

1.8 Flat Screen Display



Smart classrooms shall have provisions to accommodate future larger flat panel display monitors for primary viewing. Display shall be sized appropriately for the room but should not be less than 42" in diagonal. Display size shall vary with classroom size. It must have the capability to connect a laptop computer for presentations.

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1.9 Computer Furniture



The computer furniture must allow instructor to effectively teach by maintaining eye contact with students seated at computer desks. The usable work space of desks shall be maximized and allow learning environments to have multiple uses. Computer monitors must be secured to prevent theft. See LACCD Computer Furniture Standard and applicable LACCD Procurement and Facilities standards.

IV. RELATED STANDARDS

The Smart Classroom Standard must be compliant with the related standards:

- LACCD Baseline Design Goals and Standards – Classrooms, Chapter 1, Room and Space Specific Goals and Standards, Category A, Classrooms
- LACCD IT Standards, IT Infrastructure Design Standards Std-01-030109
- LACCD IT Standards, IT Structure Cabling Systems Design Standards STD-02-030109
- LACCD Baseline Design Goals and Standards – CLASSROOM - MECHANICAL, ELECTRICAL, AND PLUMBING DESIGN CRITERIA – Electrical
- LACCD Baseline Design Goals and Standards – CLASSROOM - MECHANICAL, ELECTRICAL, AND PLUMBING DESIGN CRITERIA – Mechanical Systems (Ventilation, Temperature, Noise, etc.)
- LACCD IT Standards, Districtwide Data Center Design STD 03-0909.
- LACCD IT Standards, Identity Management Standard*
- LACCD IT Standards, Applications Standard*
- LACCD IT Standards, Physical Security Standard*
- LACCD IT Standards, Virtual PC's Standard*
- LACCD IT Standards, Control Panel System Standard*
- LACCD IT Standards, Sound Amplification Standard*
- LACCD IT Standards, Interactive Whiteboard Standard*

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- LACCD IT Standards, Document Camera Standard*
- LACCD IT Standards, Computer Furniture Standard*
- LACCD IT Standards, Videoconferencing Standard*

**These standards will be made available at a date and time to be determined by the District. Instructions on how to access these standards will be supplied at that time.*

V. EXCEPTIONS OR WAIVER REQUIREMENTS

Process

[insert process here]

Compliance

Failure to comply with the exception or waiver requirements and process will lead to *[insert]*

VI. REQUESTS FOR CLARIFICATION

A request for clarification on any of the standards listed above may be emailed to *[insert email address]*. In order to be considered, the request must include the following information:

- The specific standard number and title;
- What aspect of the standard needs clarification; and
- One or two solutions

VII. REFERENCES

- California Community College Space Planning Standards for Classroom, California Code of Regulations, Title 5: Education, Division 6: California Community Colleges, Chapter 8: Construction, Subchapter 1: Community College Construction Act
- The Americans with Disabilities Act (ADA), 1990

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VIII. GLOSSARY

The following terms are defined as follows:

1. **Need** means that the item or course of action is essential and it will be absolutely required at the time indicated in the standard. (e.g. A high level risk assessment **needs** to be performed...)
2. **Call for** means that the item or course of action is absolutely required.
3. **Are to be provided** means that the item or course of action must be supplied in order to meet the standard.
4. **May be required if** means that if the condition stated in the standard is met, the capability, performance expectation, or any other description in the standard is absolutely required.
5. **Recommended** means that the course of action is in accordance with (Insert Applicable Area such as Security) Best Practices and should be adopted.
6. **Not Recommended** means that a course of action is not consistent with (Insert Applicable Area) Best Practices and/or other laws, codes, or requirements and should not be adopted.
7. **May/Might/Can** mean "optional." The items specified using this language may be included or omitted depending upon the consultant/'s preferences. However, even if one particular item is optional, the item chosen must still interoperate or function with the District's existing systems.
8. **Preferred/encouraged** mean that one item or course of action is favored over other optional courses of action because of proven favorable outcomes.
9. **Acceptable** means that the item or course of action is only a minimum, and the consultant/ may supersede the quality or performance of that item or course of action.

IX. DOCUMENT HISTORY

CHANGE NO.	DESCRIPTION OF CHANGE	INITIATOR	ISSUE DATE	PAGE NO.
[xxxxx]	Original document: ITSTD-2010-01-SC This documents was compiled, reviewed and approved with representation from the following groups: DTC	[xxxxxxxxx]	[xxxxxxxxx]	[xxxxx]
	Re-approval of existing Standard in (Repository)	Name	Date	