

Revision: 1/19/05

Classroom Technology Standards Document

This document has been adopted as the Classroom Technology Standards document by Portland Community College. Any work done outside this scope needs to be documented and approved by the Instructional Media Services department. These standards apply to new building projects and any technology upgrades to classrooms throughout the PCC district. To discuss Technology Standards, contact Robert Schmitt at 503-977-4443.

This document includes:

- I. Purpose and Goals Overview**
- II. Pathway Standards**
- III. Room Descriptions and Pricing**
- IV. Layout Diagrams**

I. Purpose and Goals Overview

Instructional Media Services has been given the responsibility to standardize, implement, and support classroom technology in new and remodeled classrooms for Sylvania, Cascade, Rock Creek, and Southeast Campuses of Portland Community College. Our goal is to install technology tools permanently in the classroom and remotely support them to reduce delivery cost and down time. It is vital that as we plan new building projects, that we standardize the methods that we use to make rooms “technology ready”. Instructors need to find familiar configurations when they are asked to teach in a new or alternate room or on another campus.

In the event that budgets will not allow for the installation of all the necessary presentation equipment for every room at time of construction, we must provide adequate pathway and design vision to easily transform general classrooms into media equipped rooms as funding permits. It is equally important to establish criteria for the environment in the classroom such as data, lighting, and acoustics. Technology may change but many constants will remain. New projection technology will require connectivity between teaching station, audiovisual sources, and a ceiling mounted projectors for the foreseeable future.

The current model for general classrooms includes a permanently located technology podium that houses a computer, VCR, DVD, and an A/V receiver. It includes a touch panel control system that gives one touch control over the different functions and types of presentation. It is also networked via Ethernet to a help desk which can log into the room’s control system for immediate remote assistance and diagnostic analysis.

The control system allows for data exchange between the control system and the help desk and allows for remote management, security, and control of room technology equipment and functions.

With this type of technology available to instructors, in a consistent and easy-to-operate teaching station, we believe instructors will be less intimidated and therefore more likely to utilize the tools.

Placing the centrally managed audio, display, and computing equipment permanently in the room, reduces labor and maintenance cost to the college. It also empowers instructors with the tools they need with help desk assistance available within seconds of a problem.

Equipment purchases will be administered through IMS for technology-equipped classrooms so that standards, responsibility, and continuous plant funding can more efficiently be facilitated. Following initial capital investment, a plant fund of at least 5% of the value of the classroom hardware is needed each year for equipment renewal and replacement. Continuing equipment replacement will cut the labor-intensive costs of repair and maintenance, permit the staff to devote more time to faculty than to hardware, and support the image of the college as having modern equipment and facilities.

Purchases not approved or administered through IMS may not be supported by the department.

Regardless of the available funding for classroom technology, it is necessary to include the proper conduit, data, and electrical services to easily upgrade lesser equipped rooms to higher levels of technology.

II. Pathway Standards

Minimum pathway and connectivity requirements for all room construction:

- (1) **Floor Box** A Spider Manufacturing (Hubbell) CFB-501 floor box will be installed in the front corner of the room beneath the teaching station location. The placement will be a minimum of 5.5 feet from each wall to allow for ADA requirements. The floor box will accept a 1 ½" low voltage conduit for AV wiring, a ¾" conduit for dedicated 20 amp 110v power service, and a 1" low voltage conduit for data. The standard floor box is Spider Manufacturing (Hubbell) CFB-501. It is necessary for the contractor or manufacturer to provide a 1 ½" opening on the end of the floor box to accommodate the specified 1 ½" conduit for pass through.
- (2) **Floor Power** A duplex 110v outlet should be mounted in the covered floor box in the designated teaching station location. The outlet will require an isolated 20 amp breaker.
- (3) **Phone/Data** A minimum of three data outlets and one phone outlet should be routed and installed into the covered floor box. This is to be in accordance with the PCC/IT standards.
- (4) **LV Conduit** Supply a minimum 1 ½" low voltage conduit from the floor box and routed into the space above a suspended ceiling. A maximum of two 90 degree sweeps will be allowed in the 1 ½" conduit. No hard angles will be accepted.
- (5) **Projector Power** A duplex power outlet must be provided at the projector location mounted facing downward on the ceiling surface. The outlet will be approximately 15 feet away from a 7 Ft. screen and 17 Ft. from an 8 Ft. screen. The outlet should be centered on the screen. This specification may vary depending on final equipment choice and exact location will be specified by IMS prior to installation.
- (6) **Projector Data** A 1" conduit will be roughed above the projector location to supply Network connectivity in the future. The conduit will be as specified by the PCC/IT standards.

(7) **AV Storage Closet** Each new building should have an AV storage closet centrally located with a minimum dimension of 10 Ft. x 15 Ft. There should be at least one 110v duplex outlet for equipment testing located near the door.

(8) **Room Lighting** Lighting is be determined by the orientation of the room. The main lighting control will be located near the teaching station. One general lighting switch should be located near the entry. Four zones of independently controlled lighting should be installed. See the lighting diagram that is a part of this document for greater detail. Low hanging reflective lighting fixtures should be avoided. These types of fixtures may impair projector placement and inhibited a clear visual pathway to the screen.

(9) **Projector Cabling** Cable connecting the teaching station to the projector and speakers will be provided and installed by the IMS department of PCC or a designated contractor.

III. Description and Pricing for Technology Rooms

Level One: Basic A/V Room

If funding is not available to install data and video display systems, all rooms should be equipped with these basic teaching tools without the necessity of delivery. An instructor will be able to give a basic video presentation and use an overhead projector in this model.

Even though these rooms are constructed with limited technology, it is necessary to install conduit, floor boxes, and power in the appropriate locations for easy upgrade to a Technology Equipped Classroom (Tech Room).

Lighting control should be located near the future teaching station. One general light switch should be located near the entrance to the room. It should be a slave to the main lighting controls at teaching station.

Basic A/V Room Cost Estimate

Room Equipment	Cost	Annual Support Budget	
Overhead Projector	\$250	Replace & Repair .025 Staff	\$130 \$700
84" Pull Down Screen	\$250		
TV/DVD/VCR Combo	\$850		
Television Cart	\$175		
Data Port	\$400		
Telephone	\$200		
AV Installation 20 hrs X \$47.50	\$950		
Total	\$3075.00	Total	\$1030.00

Level Two: Technology Equipped Classroom (Tech Room)

This room will allow instructors to display computer and video images using a data grade projector to an 84" screen at the front of the room. The data projector should be bright enough (2000 ANSI lumens or more) to be functional in a lighted room. The screen location will vary slightly depending on the projector location. In addition, the model offers multimedia options such as VCR, DVD, and a audio system.

Computer and video equipment will be located in a teaching station. Lighting control should be located near the teaching station. One general light switch should be located near the entrance to the room. It should be a slave to the main lighting system.

An Ethernet connected touch panel and control system will be installed for easy operation of all electronic equipment in the podium and the projector. It will also serve other functions such as instructor assistance, equipment security, and maintenance alerts. The system will have an IP address, which will require a second data port in the teaching station.

Media Ready Classroom Cost Estimate:

Room Equipment	Cost	Annual Support Budget	Cost
Overhead Projector	\$250	Replace & Repair .10 Staff	\$1000
84" Pull Down Screen	\$150		
Data Grade XGA Projector	\$2750		
DVD	\$200		
VCR	\$200		
Audio System	\$500		
Cabling and Security	\$600		
Control System	\$2000		
Technology Podium	\$1750		
3 Data Ports	\$400		
Telephone	\$200		
Specialty Contractor	\$1000		
Computer	\$1700		\$3000
Equipment Total	\$14,775.00	Total annual support:	\$4000.00

Science and Computer Wired Lab

The standard computer lab places a CPU and monitor at each student location. Other than the addition computers, power, and data, the equipment remains the same as a Technology Equipped Classroom. Two data connections, phone, and power are necessary for each station for connectivity for the wired and wireless lab models.

Computer and video equipment will be located in a teaching station. The teaching station could be either a stand-up podium or a desk type teaching station with the same technical capabilities. This will allow a location for a computer and other components for presentation. Control for lighting should be located near the teaching station. One general light switch should be located near the entrance to the room. It should be a slave to the main lighting system.

Standard Computer / Science Lab

Room Equipment	Cost	Annual Support Budget	Cost
Computer (CPU Type)	\$1700		
20 Student Computers	\$30,000		
Teaching Station	\$2250		
Printer	\$800		
Overhead Projector	\$450		
Overhead Projector Cart	\$150		
84" Pull Down Screen	\$500		
Data Grade XGA Projector	\$4500		
DVD	\$200		
VCR	\$175		
Speakers and Amp	\$1000		
Cabling and Interface	\$750		
Control System	\$2500		
22 Data Ports	\$4400		
Telephone	\$200		
Specialty contractor	\$4500	Replace & Repair	\$2800
Total	\$54,075.00	.10 Staff	\$3000
		Total annual support:	\$5800.00

Wireless Computer / Science Lab

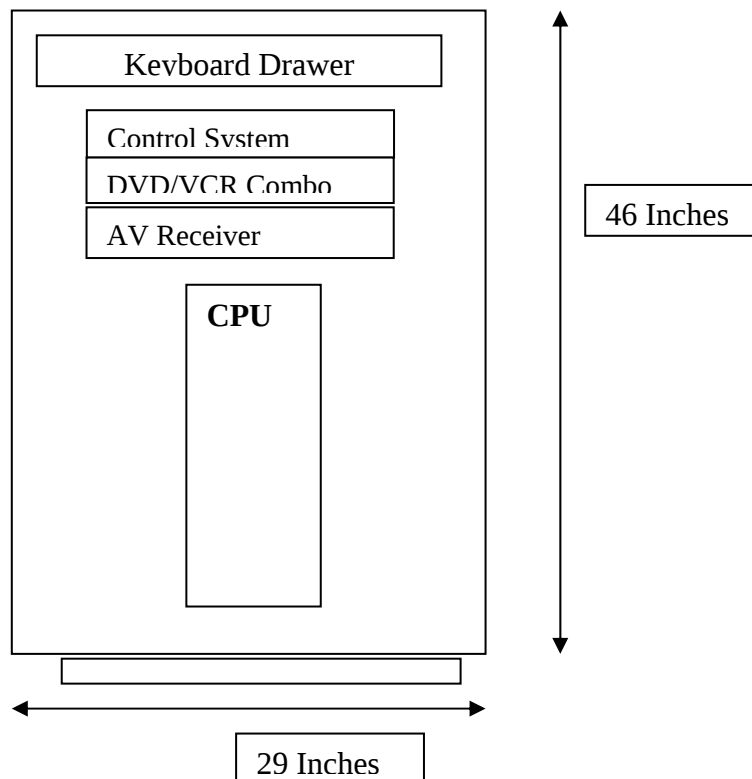
In the wireless model a wireless laptop is provided to each student and one for the instructor at the teaching station. Other than the addition of laptops and wireless access points, power, and data, the equipment remains the same as a Media Ready Classroom. Two wired data connections, phone, and power are necessary for the teaching station for redundant connectivity and connection to the control system.

Computer and video equipment will be located in a teaching station. This will allow a location for the instructor's computer and other components for presentation. Control for lighting should be located near the teaching station. One general light switch should be located near the entrance to the room. It should be a slave to the main lighting system.

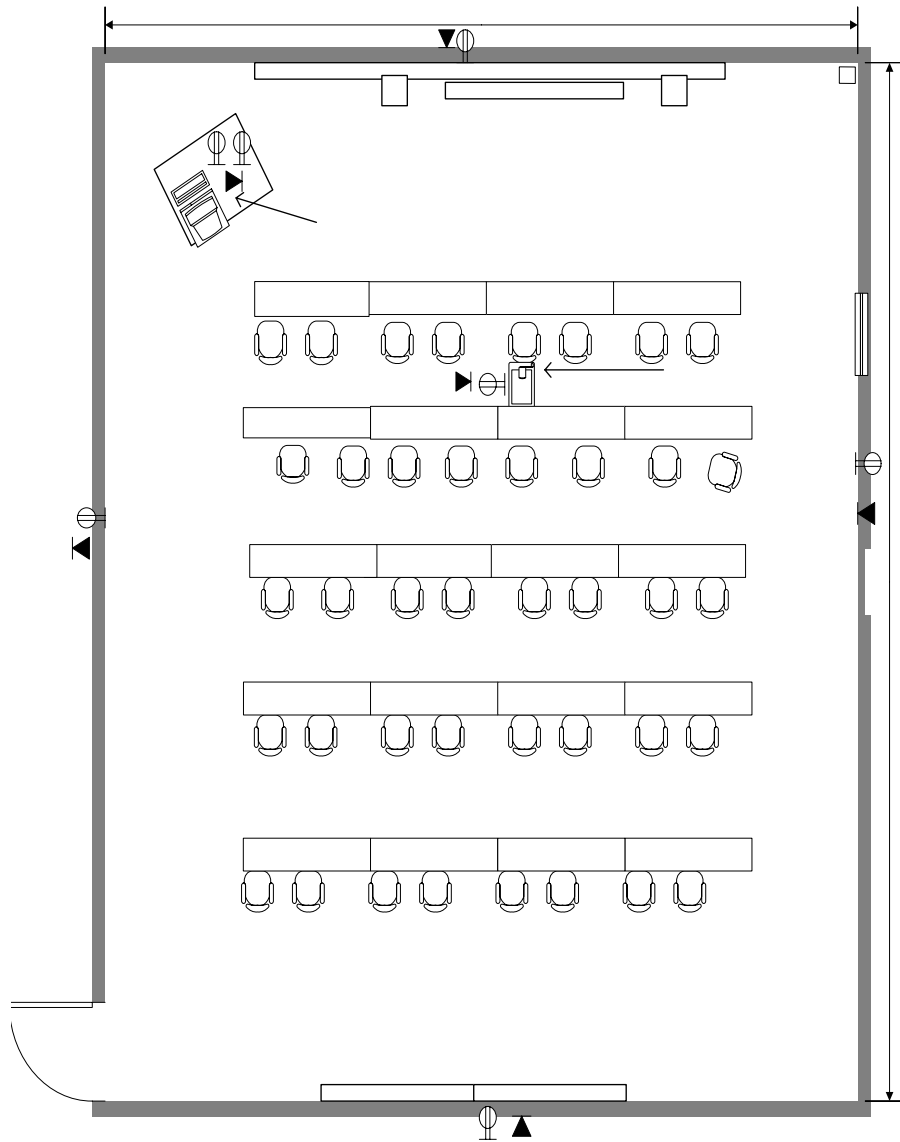
Wireless Computer / Science Lab Costs

Room Equipment	Cost	Annual Support Budget	Cost
Computer (CPU Type)	\$2500		
20 Student Laptop Computers	\$50,000		
Teaching Station	\$2250		
Printer	\$800		
Overhead Projector	\$450		
Overhead Projector Cart	\$150		
84" Pull Down Screen	\$500		
Data Grade XGA Projector	\$4500		
DVD	\$200		
VCR	\$175		
Speakers and Amp	\$1000		
Cabling and Interface	\$750		
Control System	\$2500		
22 Data Ports	\$4400		
Telephone	\$200		
Specialty contractor	\$4500	Replace & Repair	\$4000
Total	\$74,875.00	.10 Staff	\$3000
		Total annual support:	\$7000.00

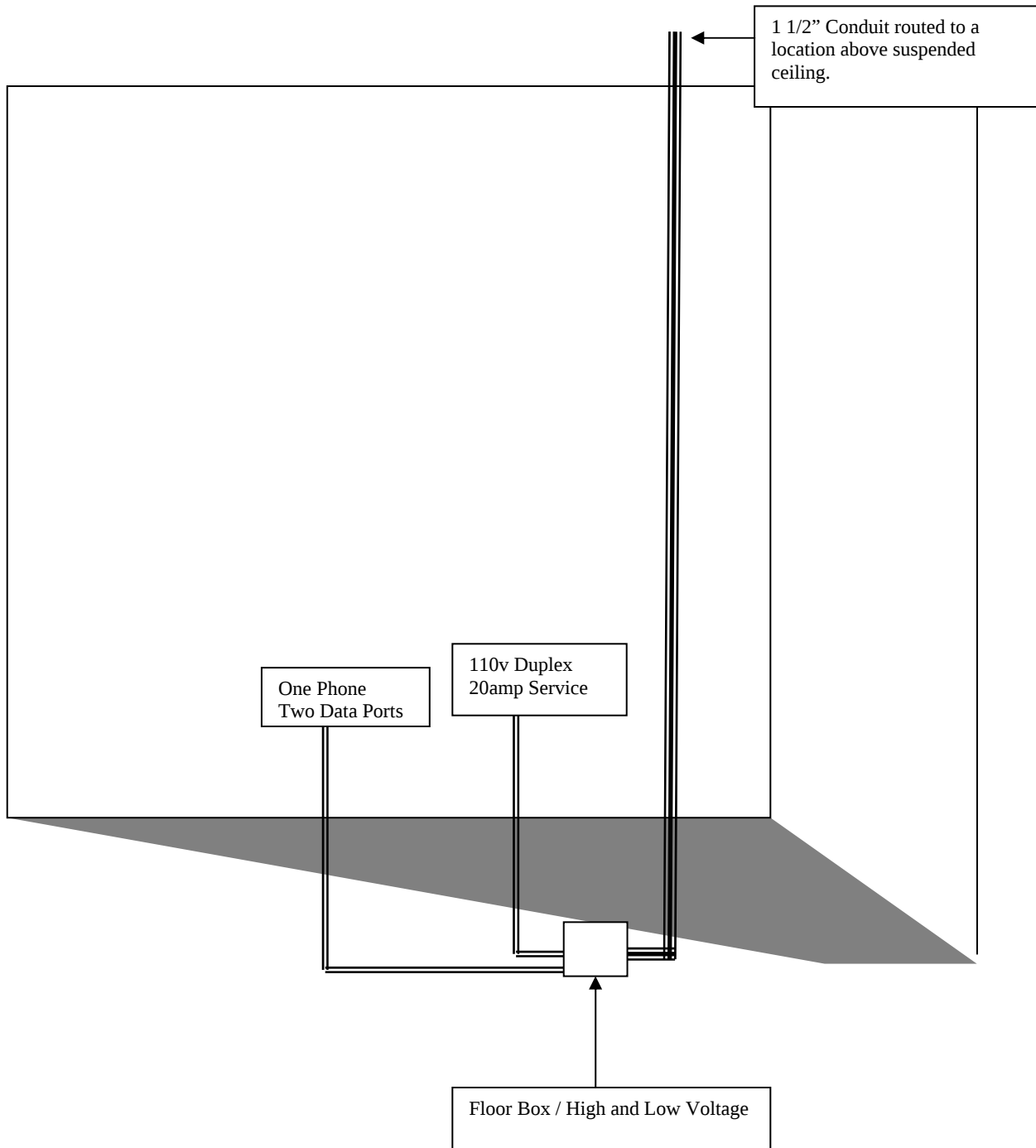
The Technology Podium System



Standard General Purpose Room

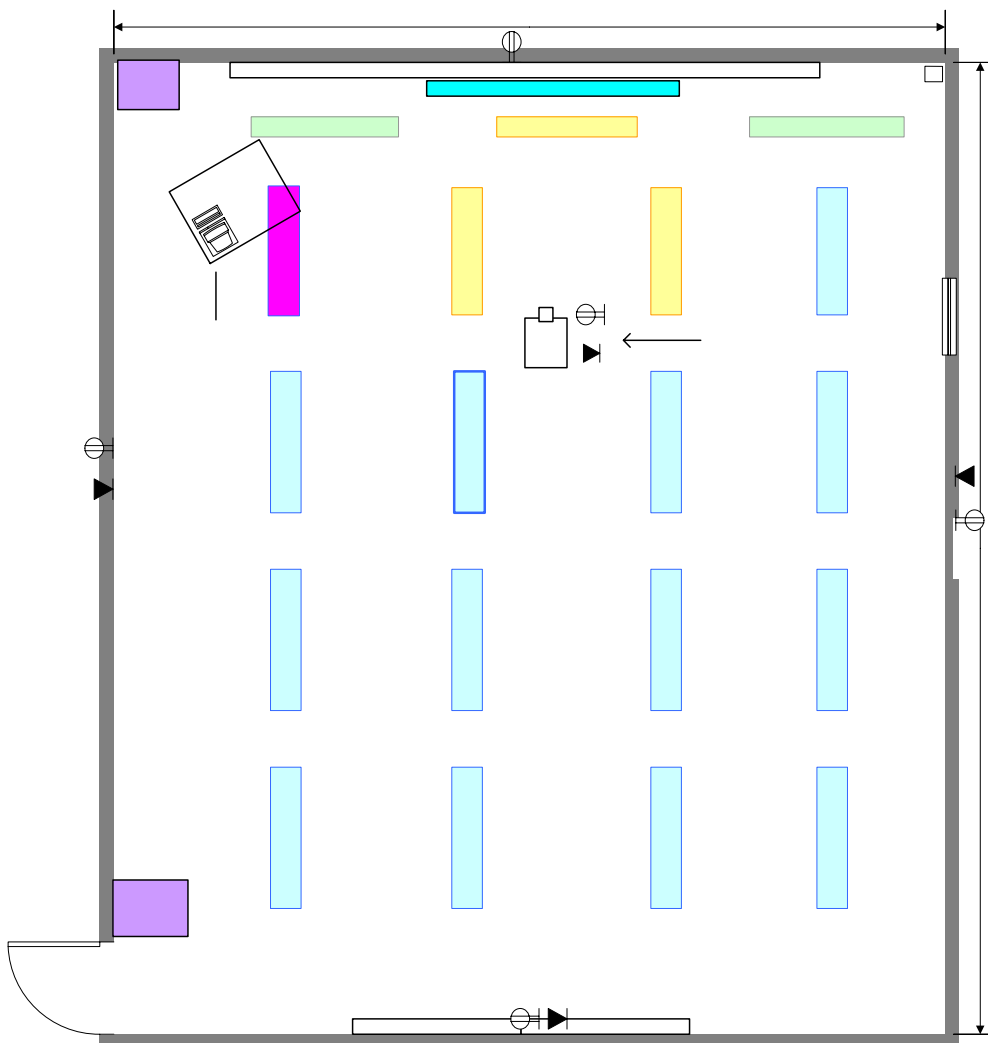


Wall Elevation View



General Lighting Zone Diagram

This diagram illustrates lighting zone requirements in a technology equipped environment. A minimum of four independently switched zones are represented. Main room lighting (blue zone 1) provides general lighting in the room. Screen lighting (yellow zone 2) includes fixtures that may illuminate the projection screen area. Wall washes (grey zone 3) are fixtures that illuminate the white boards and chalk boards. Teaching station (magenta 4) is a fixture that can illuminate the teaching station while the room lights are dimmed. Low voltage lighting interface is desirable. Otherwise the main lighting control should be mounted near the teaching station with an entry switch near the door. Lighting fixtures should not be low hanging reflective instruments. These types of fixtures place limits on location and sight lines of ceiling mounted projectors.



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Contact: Robert Schmitt, Coordinator AV Services
Phone 503-977-4443 / Cellular: 503-969-2941
email: rschmitt@pcc.edu