INFORMATION/COMMUNICATIONS RESOURCE REQUIREMENTS

VOICE/DATA/VIDEO COMMUNICATION STANDARDS

UNIVERSITY BUILDING STANDARDS

REV: 12-05-07 WAD

Guidelines

All wiring will be in accordance with the ANSI/TIA/EIA-568-B and its addenda standard for telecommunications wiring.

All copper RJ45 jacks will be wired in accordance with T568A wiring pattern.

The campus telecommunications systems derive from Perry Paige (data), Coleman Library Complex (video), and Foote-Hilyer (voice).

The standard wiring plan for the University is to provide an acceptable outlet for any communications device (voice, data or video) which requires connection to other devices, networks, or information services serving general university needs.

All new and upgrade work at the University should meet these guidelines unless otherwise directed.

NOTE: All backbone fiber patch cords must be Corning or Belden products. All infrastructure products for retrofitting or new construction, (ex. wall outlets, category 6 patch cords, etc.) must be a product of Corning or Belden. These requirements are a must to stay in accordance and maintain the University's current 25-year warranty on all products and materials. All contractors must be Corning EWP certified and Belden CSV certified, please refer to the Installer / Contractor Requirements Section.

Requirements

Copper to the Desktop

All communication outlets will be equipped with but not limited to two (2) category 6, twisted pair copper station wiring, both terminating in a RJ45 modular jack. Unless otherwise specified in the design phase, all cables will terminate to a category 6 patch panel within the wiring closet. A category 6 patch panel will be installed to connect with the telephone company demarcation point. All connections between the active data equipment and/or the voice patch panels to the category 6 station wiring patch panel will be accomplished through category 6 RJ45 jumpers.
**Wireless Network**
All new and retro-fitted facilities are required to have wireless communications. Refer to the Wireless Network Documentation

**General**

All station wiring will be continuous wire from the MDF/IDF to the communication outlet,

All MDF/IDF terminations shall be of 100% cross connected as per the ANSI/TIA/EIA-568-B and its addenda specifications.

To facilitate future cable installations, a new pull string shall be installed in conduits simultaneously with the pull-in of cable.

All MDF/IDF shall be provided with one or more grounded 19" by 84" EIA standard wiring rack(s) and category 6 patch panels / Rack mount fiber termination cabinets or splice housings in quantities necessary to terminate the required cables. Appropriate wire management hardware will be provided to support routing of patch cables in a neat and organized manner.

The electrical work shall include requirements for installation of a conduit (1" minimum diameter) from each communication outlet and "stubbed" up above ceiling level. A pull string and appropriate junction or "pull" boxes shall also be provided in each conduit run to facilitate future installation of cable(s). Cable trays shall be installed to route the station cable to the MDF/IDF.

All IDF, MDF and connecting blocks must be properly identified according to specifications provided by the Information Resource Manager.

All cable pairs in copper riser cables or the copper entrance cable must be terminated on Category 6, 110 style to RJ45 patch panels and identified according to ANSI/TIA/EIA 606-A specifications.

Fiber runs between MDF and IDF shall consist of a 12 fiber 62.5/125 micron multimode cable and a 12 fiber single-mode cable terminated in SC connectors and placed in appropriate fiber patch panels.

All communication outlets not in use, either wired or empty, must have a blank plate covering the outlet.

All modular jack assemblies must be labeled and identified according to ANSI/TIA/EIA 606-A specifications.
All wiring inside of rooms should be protected by conduit or other means such as wire mold.

Cable may be run exposed above ceilings, provided this cabling is supported independent of other utilities, such as conduits, pipes, ceiling support systems, cable trays, and not laid directly on the ceiling panels. Cable to be plenum rated.

All patch cables both copper and fiber are to be provided by the contractor at the time of completion. All copper patch cables are to be category 6 compliant and 7’ in length. All MDF/IDF patch cords should be 3 meters sc-sc type.

**Installer / Contractor Requirements**

**General condition –Approved Vendor**

**General**

The Contractor must be a Belden-authorized Certified System Vendor (hereinafter referred to as Belden CSV) of the Belden IBDN Gigabit System 2400. The Vendor must have successfully completed all Belden IBDN design and installation training provided by Belden. Contractor must also be a member of the 2007 Corning Extended Warranty Program and must adhere to the engineering, installation and testing procedures and utilize the authorized manufacturer components and distribution channels in provisioning the Project.

The Contractor shall show proven expertise in the implementation of cabling projects. This expertise can be illustrated through the inclusion of details of at least three (3) projects involving the design and installation of a Category 6 unshielded twisted-pair (hereinafter referred to as UTP) cabling systems within the past two (2) year period. Names, addresses and telephone numbers of references for the three (3) projects should be included. Proof shall be required at the time of quote acceptance that the Firm or Company is an established organization, within (20) miles of the project,

The successful bidder should hereinafter be referred to as the Vendor.

The Vendor should accept complete responsibility for the design, installation, acceptance testing and certification of the Belden IBDN Gigabit System 2400.

The Vendor should provide proof of current Belden CSV status and should deliver the Belden certification of the installed Belden IBDN Gigabit System 2400 to the Purchaser.
General condition – Approved Installer

General

The vendor must be a Belden-authorized Certified System Vendor (hereinafter referred to as Belden CSV) of the Belden IBDN Gigabit System 2400. The Vendor must have successfully completed all Belden IBDN design and installation training provided by Belden. The vendor shall be a licensed and registered with the State of Florida Department of Business Professional Regulation and who is, and who has been, regularly engaged in providing and installing non-residential, communication and technology systems of this type and size for at least the immediate past five (5) years and one (1) RCDD on staff as permanent employees. The Contractor's Project Manager, Foreman, and Technicians shall possess current 2007 Belden’s IBDN-700R certificate of completion for the system being provided.

The installation of the Belden IBDN Gigabit System 2400 should be performed by employees of the Vendor and shall be required to provide proof of Belden authorization to install a Belden IBDN Gigabit System 2400. Installers: Due to the time restriction and the accelerated project schedule the Systems Contractor shall directly employ a minimum of ten (10) skilled systems installers with current 2007 IBDN-700R course certificate of completion and whose normal work is systems installation, who shall provide all systems equipment and who shall make the wire and cable connections thereto.

All work should be performed and supervised by technicians and managers qualified to install and test the Belden IBDN Gigabit System 2400 in accordance with Belden requirements. The supervisor should have a minimum of 5 years experience and successfully completed Belden IBDN installation training provided by Belden.

General condition – Approved products

Approved products

Here is a list of approved products.

- Approved 4-pair UTP Cable: Belden IBDN Gigaflex 2400 Cable series (Cat. 6)
• Approved RG 6 Cable: Belden 1189AP Coax
• Approved high pair count UTP Cable manufacturer: Belden
• Approved UTP connector product manufacturer: Belden
• Approved Rack and Cabinet manufacturer: Belden
• Approved IDC cross-connect system manufacturer: Belden
• Approved Patch Panel manufacturer: Belden
• Approved UTP Patch Cord manufacturer: Belden
• Approved Fiber Optic Cable: Corning Cable Systems

Equivalent products

Due to the nature and type of communications all products, including but not limited to faceplates, jacks, patch panels, racks, IDC blocks, copper cable products and patch cords, for the purpose of this document, should be manufactured by Belden. There will be no substitutions allowed.

Building Communication Facilities

General

Guidelines concerning the number of communications outlets by room type are outlined below. Specific requirements for each room and each project shall be coordinated with the using agency at the onset of design for the project, the architect/engineer is cautioned that the Building Program also includes requirements, but may not be all inclusive regarding communication facilities. Therefore, the project architect/engineer must work very closely with appropriate Using Agency and Voice/Data/Communications personnel during initial planning to assure total coordination and minimize the need for revisions or changes at the second or design development document submittal stage. Sections 4 and 5 also contain data of concern to the project architect/engineer.

Terminations

Faculty/Administrative Offices - Each office shall have one communication outlet per 80 square feet. ((2) CAT6 per outlet)
Clerical/Staff Offices - One communication outlet per designated occupant plus one spare cabled outlet for every two (2) occupants or fraction thereof or one communication outlet per 80 square feet whichever is greater. (2) CAT6 per outlet

Secretary/Administrative Assistant Offices - One communication outlet per designated occupant plus two outlets per office area or 2 extra outlets per five people or one communication outlet per 80 square feet whichever is greater. (2) CAT6 per outlet

This extra facility allows for future growth and/or high density office/business machines used concurrently with other staff activities (perhaps facsimile transmission while using a word processor).

Lab

Conference Rooms - One communication outlet per 80 square feet with two CAT6 per outlet with a minimum of (1) Wireless Access Point

Dormitories - One data communication outlet and one F type coaxial outlet for each planned occupant per dormitory room. (1) RJ45 (CAT6) per pillow. If the unit is single room, multiple occupancy units, the above specifications will apply to the room. All dormitory building facilities will also be provided with direct fiber optic connection to the campus backbone. This connection will consist of (12) 62.5/125 micron multimode fibers and (12) single mode fibers. Each dormitory facility will also include a Main Data Closet to house the active (SWITCH) equipment and the terminated fibers to the campus backbone. Two 48-port POE switches per building & 6 - 10 access points per floor (transmission & security scanning) for the Wireless Network.

Facilities

Trunk and Access Facilities

Copper (Twisted Pair / Coaxial) cables from the communication outlets described in the previous section should be connected to an accessible MDF/IDF close to the center of the terminations on each floor rather than at the single (or major) communications room for the building. The fiber cables from the communication outlets described in the previous section should be routed through an accessible MDF/IDF close to the center of the terminations on each floor and either home run or fusion splice onto high count riser cables that lead to the MDF where all data communications electronics will be located.

Spaces, for a communications trunk to support future instructional needs, must interconnect laboratory, classroom, office pad areas, and the building communications equipment room.

Cable tray (preferred and greater than 6 inch cross section) or a 4" conduit is an appropriate facility (raceway) if the actual needs are not known,
Communications Equipment Room

Space for connection of the building circuits to the outside plant should be provided as a separate room and not shared with other utility services, particularly the electrical service. When possible, it will not be adjacent to the electrical distribution room.

Minimum room size is 100 square feet for MDF and 60 square feet for each IDF. A size may or may not be included in the Project Building Program. The project Architect/Engineer must, during the initial (Schematic-Preliminary) Planning stage, engage coordinated efforts of the Information Resource Manager’s Office, Facilities Management and the Using Agency to assure appropriate size and arrangement of the communications equipment room(s).

TELEPHONE - At least 1 Telephone per MDF / IDF.

LIGHTING - All communications equipment rooms (MDF & IDF) shall have a light intensity of 50-70 foot candles at 30 inches above the floor.

DUST ELIMINATION - The walls, floors, and ceiling of all communications equipment rooms (MDF & IDF) shall be painted or otherwise treated to eliminate dust. If the walls are painted, a light colored, latex type paint should be used.

BACKBOARD - All MDF & IDF shall have fire retardant plywood backboards 8'x4'x3/4" mounted on the back and side walls. The plywood backboard shall be affixed in such a manner that it will adequately support the weight of the cable, terminals, and other equipment that will be attached to it. The plywood backboard shall be treated with a fire retardant material.

VERTICAL RISERS - Communications equipment rooms (IDF & MDF) contain the vertical cable riser space. The communications equipment rooms shall then provide vertical riser sleeves and bushings through the floor and/or ceiling to other vertically stacked communication equipment rooms. All sleeves shall be a minimum of 4 inches in diameter or sized to support the actual cabling requirements whichever is greater. Every communications equipment room should be equipped with a minimum of 5 riser sleeves; 2 for voice, 2 for data and 1 for video or any additional sleeves as required by actual cable needs.

The communication equipment rooms shall be centrally located to optimize the length of the cable run to the telephone outlets. The length of a cable run shall not exceed 290 feet. In multi-level buildings, the communications equipment rooms should be located over the vertical cable riser space.

ROOM TEMPERATURE AND HUMIDITY - The ambient temperature shall be maintained between 60 and 68 degrees Fahrenheit and the relative humidity shall be maintained between 20 and 50 percent, unless otherwise specified. Temperature, and
humidity requirements are on a 24-hour, 7 day-a-week basis regardless of the heat generated by normally operating communication equipment.

Special ventilation may be required for a battery back-up system in some buildings.

**Electrical Facility Relationships**

Building earth ground must be provided for all communications equipment rooms such that the DC resistance from the rooms to the building earth ground on the longest run does not exceed 0.5 ohms.

In the MDF, at least six 120V, 20 amp dedicated circuits with duplex outlets whose feeds are isolated from any motors, air conditioning or lighting circuits must be provided irrespective of room size. A separate small sub-panel with integrated surge suppression would provide the proper isolation in the MDF. At least three 120V, 20 amp circuits with duplex outlets must be provided in the IDF.

Although the electrical load is minimal (most terminals draw less than 1 amp), every component requires electrical service: modems, terminals, printers, etc. Each communication outlet (equipped or wired for) must be provided with a 120V, 20 amp circuits with duplex outlet whose feed is isolated from any motors, air conditioning or lighting circuits.

**Lock**

Access to all rooms or closets containing voice or data equipment will be through one uniform master key system. The standard key for all communications closets shall be a unique key under the Best lock grand master key system. No key will be issued by the Key Bank without the signed approval of the Director of Information Resource Manager Campus-wide Network Services.

**Security**

All MDF and IDF must have Proxy access. All users must be approved by the Director of Network Infrastructure and C.I.O.

**Outside Plant**

All new building construction planning must include a connection into existing tunnels or manholes and should connect via five (5) 4" conduits. These conduits would be for the data, voice and video facilities only.

Whenever possible, all abandoned cable should be removed from tunnels, manholes, and conduit. If it is not feasible to remove said cable, it should be clearly tagged as abandoned and should be reported to the Information Resource Manager.
No cable should be installed in any facilities (raceways) other than those intended for that use. Gas pipe and water pipes must not be used for conduit under any circumstances.

All buildings shall be wired with a 75 OHMS RG6 U coaxial cable.

All buildings video topology shall be star-wired to a closed-circuit television (CCTV) stainless steel communications wall plate with F81 barrel splice termination.

The signal strength at the F81 wall plate outlet shall be measured at no more than 10dB.

All connectors shall be one-piece crimp-on.

All connections between the CCTV backbone network and the building communications closet shall be made with jacketed 1/2” coaxial cable or Single-mode fiber.

All new building construction planning must include a connection to the campus fiber optic backbone which terminates in the Perry-Paige building. This backbone connection must consist of a 48 strand composite fiber optic cable (24 – Single-mode and 24 Multimode).

**Outside Plant Fiber Optic Cable Specifications**

The 48 strand composite cable shall consist of 24 Multi Mode fibers and 24 Single Mode fibers with 2 sub groupings distributed as follows: 1 Multi Mode sub groupings containing 24 multi-mode fibers each and 1 single mode sub grouping containing 24 single-mode fibers. The Multi mode sub grouping will be individually color coded. The Single mode sub grouping will be individually color coded and imprinted with a black stripe or hash mark imprinted on the buffer tube.

**Multimode Fibers:**

All multi-mode fibers will be 62.5/125micron fiber. All cables will be of loose tube construction with the following fiber specifications: 100 KPSI proof tested; Core diameter 62.5um +/- 3um; Cladding diameter 125um +/- 2um; Core Non-Circularity less than or equal to 6%; Cladding Non -Circularity less than or equal to 2%; Numerical Aperture of 0.275 +/- 0.015; Coating Concentricity Greater than or equal to 0.7; Primary coating shall be 250 +/- 15 micron dual layered UV cured acrylate applied by the fiber manufacturer which may be mechanically or chemically stripped without damaging the fiber; Multi Mode attenuation less than or equal to 3.5 db/km @ 850nm and 1.5 db/km @ 1300nm; minimum bandwidth of 160 mhz @ 850nm and 500 mhz @ 1300nm (this specification shall be a maximum attenuation for each fiber over the entire operating temperature range of the cable).

**Single-mode Fibers:**
All Single Mode fibers will be 8.3/125 micron fibers. All cables will be of loose tube construction with the following fiber specifications: 100 KPSI proof tested; Core diameter 8.3um; Numerical Aperture of 0.13; Cladding diameter 125um +/- 2um; Core to cladding offset of less than or equal to 0.8um; Cladding Non-Circularity of less than or equal to 1.0%; Coating Concentricity Greater than or equal to 0.7; Primary coating shall be 250 micron dual layered UV cured acrylate applied by the fiber manufacturer which may be mechanically or chemically stripped without damaging the fiber; The cabled fiber cutoff wavelength shall be less than or equal to 1250nm; Attenuation Uniformity - no point of discontinuity greater than 0.1db at either 1310nm or 1550nm; Single Mode attenuation less than or equal to 1.0 db/km @ 1310nm and .75 db/km @ 1550nm (this specification shall be a maximum attenuation for each fiber over the entire operating temperature range of the cable).

**General Cable Specifications:**

Optical fibers shall be placed inside a loose buffer tube containing up to 18 fibers. The fibers shall not adhere to the inside of the buffer tube. All optical fibers and buffer tubes shall be color coded per ANSI/EIA/TIA-568-B.3. In buffer tubes containing multiple fibers, the colors shall be stable during temperature cycling and not subject to fading or smearing onto each other or into the gel filling material. Colors shall not cause fibers to stick together. Fillers may be included in the cable core to lend symmetry to the cable cross-section where needed. The cable shall contain a central strength member composed of an all dielectric epoxy/glass composite. Each buffer tube and the cable core interstices shall be filled with a non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogenous gel. The gel shall be free from dirt and foreign matter. The gel shall be readily removable with conventional non-toxic solvents. Binders shall be applied with sufficient tension to secure the buffer tubes to the central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking (or rendered so by the flooding compound), and dielectric with low shrinkage. Tensile strength shall be provided by high tensile strength aramid yarns and/or fiberglass. The high tensile strength aramid yarns/fiberglass shall be helically stranded evenly around the cable core. All dielectric cables (with no armoring) shall be sheathed with medium density polyethylene. The minimum nominal jacket thickness shall be 1.0 mm. Jacketing material shall be applied directly over the tensile strength members and flooding compound. All fibers must be useable and meet minimum specifications, no spare fibers shall be included. The fiber optic cable shall withstand water penetration when tested with a one meter static head or equivalent continuous pressure applied at one end of a one meter length of filled cable for one hour. No water shall leak through the open cable end. Testing shall be done in accordance with FOTP-82, "Fluid Penetration Test for Filled Fiber Optic Cable." The cable shall exhibit no flow (drip or leak) at 80 degrees C. The weight of any compound that drips from the sample shall be less than 0.05 grams (0.002 ounce). A representative sample of cable shall be tested in accordance with FOTP-81, "Compound Flow (Drip) Test for Filled Fiber Optic Cable." The test sample shall be prepared in accordance with method A. All optical fibers shall be 100% attenuation tested.

**Outside Plant Fiber Optic Cable Specifications (Continued)**
The attenuation of each fiber shall be provided with each cable reel. Cables shall have crush resistance of 220 N/cm, Flex resistance of 25 cycles, and impact resistance of 25 impacts. All cables will have tensile strength of greater than or equal to 2700N short term and 600N long term. Minimum bend radius for all cables will be less than or equal to 20 times the outside diameter under installation tensile load and 10 times the outside diameter under long term tensile load. All fibers in the cable must be useable fibers and meet required specifications. The cable provided will be new, unused, and of current design and manufacture. Outer jacket shall be fungus resistant, UV inhibited, Water resistant, and shall have a non wicking rip cord for easy removal. The outer jacket or sheath shall be free of holes splits or blisters. Outer cable jacket will be marked with "(Manufacturer’s Name) Optical Cable", Sequential foot or meter markings, and year of manufacture. The height of the markings shall be approximately 2.5mm. The cable jacket shall contain no metal elements and shall be of a consistent thickness. The outer jacket color shall be black.

**NETWORK DESIGN**

Each building or physically connected building complex will support user connections at 10/100/1000 full duplex switch Ethernet speed. The main switch for the building shall be equipped with an Gigabit switch capable of performing LES/BUS/LANE functions should it’s connection from the campus backbone become inoperative and should connect to the campus backbone via redundant load sharing Gigabit Single mode or Multimode links.

**NETWORK SWITCHING EQUIPMENT**

Each network switch will have as a minimum the following functions.

- Backplane support for switched GBPS speeds Ethernet.
- Backplane support for Gigabit switching
- Uplink capability forms the switched Ethernets to the Gigabit switch fabric.
- Each switch shall include redundant load balancing power supplies capable of N+1 redundancy.
- Full SNMP Management of all chassis/bridging functions.
- Support the LANE, PNNI, and MPOA standards that are current at the time of acquisition.
- Support upgrades to Layer 3 switching as the standards become established.
- Full RMON support for all RMON groups standardized at the time of acquisition.
Per port RMON / RMON II support for all switched Ethernet ports as well as port replication.

Support for out of band / side band network management via isolated 100 or 1000 MB Ethernet.

**Wiring Closet Power Supplies**

Each wiring closet will be provided with one or more rack mounted uninterruptable power supplies of sufficient capacity to power all active data equipment within the closet.

Each UPS will be fully SNMP manageable or shall be capable of being managed through the switching equipment.

**Testing and Certification**

**COPPER TWISTED PAIR CABLE**

Each station cable will be tested for continuity from the closet to the workstation. This test shall verify continuity, determine the proper polarity and verify proper location of each pair of the 4 pair cable.

In addition to a continuity test each station will be tested with a 100 or 1000Mb tester to verify each station location to be category 6 compliant. The tester shall provide a hard copy printout of each cable tested.

Each pair will be checked for noise level and signal loss. The total loss for a cable shall not exceed -5db. This test shall be performed on the four common bands (1-4). Band 1 Low 10Khz-150Khz; Band 2 ALL 10Khz-100Mhz; Band 3 High 10Mhz-100Mhz; Band 4 Impulse noise.

Each cable will be scanned for length bi-directionally with an automated test unit, If the distance readings are different the cable must be tested for faulty punch downs.

Each cable tested is to be recorded in a log with the cable number, date, and the initials of the technician who tested the cable. A printout of the test results for each cable shall be placed in the log. Any cables failing the above tests shall be replaced. A copy of the logs, a termination sequence chart, and all test results shall be provided to the Information Resource Manager prior to acceptance of the job as satisfactory and complete.

**FIBER OPTIC CABLE**

Testing and certification will be performed by the installing contractor to verify the correctness of termination and overall transmission loss using an approved fiber optic transmission loss test instrument.
A certification report shall be provided listing the calculated and measured loss at both 850 and 1300 nanometers for multimode fibers and 1310 nanometers for single mode fibers. The certification report shall also include the installed lengths for all fibers within the cables that have been provided. All cabling will be tested bi-directionally with an optical power meter with printouts of the results for each fiber provided as part of the certification documents. All fibers will also be tested bi-directionally with an OTDR and printouts of the traces for each fiber will be provided as part of the certification documents. The University desires to achieve the following minimum results.

All Multi Mode cables not to exceed 1 db plus .0013 db per foot end to end attenuation at 850nm

All Single Mode cables not to exceed 1 db plus .0008 db per foot end to end attenuation at 1310nm

Approval of the test results will be made by the Information Resource Manager before the project is accepted by the University as satisfactory and completed.

CABLE TV  (Campus Cable Television System) CCTS

Cable TV outlets should consist of (1) RG-6 per TV location. All Cable TV request should be entered into the EIT TMS Service Request system and approvals are made by the Director of Network Infrastructure.

FACILITY INFORMATION RESOURCE REQUIREMENTS

This facility includes areas to be used as laboratory and classroom space as well as staff and support offices. The nature of these offices requires the need for communication and computing. Additionally these areas will have the need for video transmission that originates within the facilities. Computing hardware for Laboratory, classroom, and office workstations will be acquired in various platforms IE: PC compatible, Macintosh, UNIX, etc.

For each of these platforms current minimum standards are:

PC/Compatible: Pentium 4.xGhz Pentium IV, 1GB RAM, 80GB Fixed disk, 48x CDRW, 16bit sound card and speakers (MPC2 Compatible), and network card appropriate to the facility that the equipment will be located in.

Macintosh: G4, 1GB RAM, 80GB Fixed disk, 64x CDROM, and network card appropriate to the facility that the equipment will be located in.

UNIX: 32bit 1GHz RISC processor, 1GB RAM, 80GB Fixed disk, 48x CDROM, and network card appropriate to the facility that the equipment will be located in.
The specifications for these platforms will be upgraded to meet the standards at the time of acquisition.

To enable printing within the facility a variety of printing devices will be acquired, including 1 or more high volume (greater than 15PPM) laser printers and smaller individual printers as required.

The information resource needs for classrooms and laboratories will depend upon the specific design and use of those classroom and laboratory facilities. As part of this equipment, included are large screen video projection units capable of reproduction of computerized video and other types of media. Large projection screens, VCRs, LaserDisc / CD players, document cameras, and specialized sound systems will also be included. Video conferencing equipment capable of facilitating distances learning activities and functional with the campus wide information technology system design and interactive video conferencing delivery systems will be installed in appropriate areas.