CURTIN UNIVERSITY

PROJECT DELIVERY GUIDELINES

AUDIOVISUAL GUIDELINES

PART 1 – ROOM AND SYSTEM STANDARDS

000314

Curtin University

TEACHING, LEARNING AND MEETING SPACES

ABSTRACT

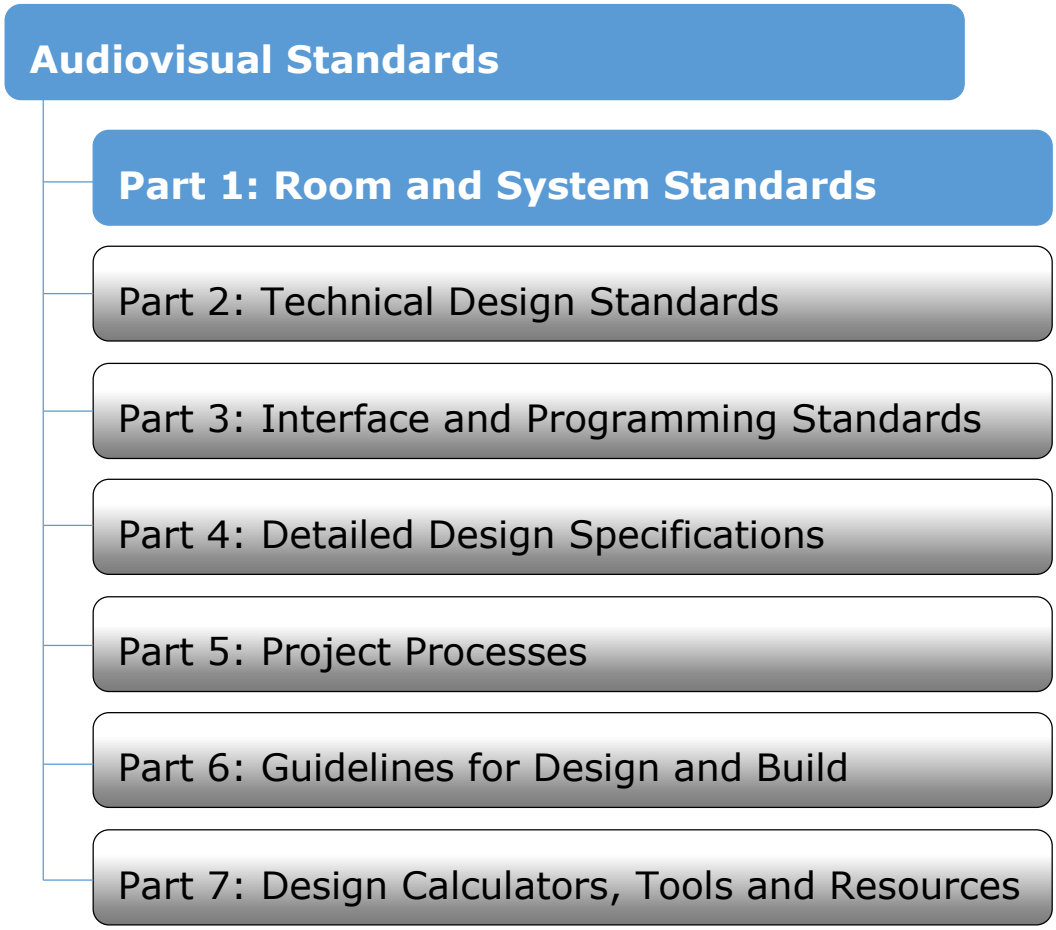
The purpose of this document is to clearly define a standard set of audiovisual room and system configurations for teaching, learning and meeting spaces at Curtin University.

Details of revisions			
Level	***Details***	***Date***	***Initial***
1	*Original document created from Audio Visual Standards Part 1 - Room and Systems Standards (v0.8)*	*Nov-16*	*RPS*
2	*Added further detail to Section 4.2*	*Sep-17*	*IRC*
3	*Minor modifications and additions relating to MET04 and reflective practice. Removed the configuration code suffix.*	*Sep-18*	*IRC*
3	*Inclusion of wording to allow departures from the existing guideline*	*Nov-19*	*RPS*

CONTENTS

TABLES

Audiovisual Standards Part 1 – Room and System Standards



1 INTRODUCTION

1.1 DOCUMENT BRIEF

This Project Delivery Guidelines document should be used when planning new work or refurbishments involving audiovisual installations throughout the University. This document defines a standard set of room and system configurations that will allow the University to own teaching spaces on all campuses that are easy to use, easy to support and highly reliable. Such standards allow a common user experience – the same look, feel and operation of audiovisual and ICT equipment – across rooms on all of the University's campuses.

The room types that are in scope for this document are described in Archibus as:

- **General Teaching Areas** – such as lecture theatres, seminar rooms, tutorial and informal learning spaces (TEFMA codes 200–208)
- **Laboratory Facilities and Design Studios** – including computer laboratories and facilities requiring presentation and/or recording functionality (TEFMA codes 304, 305, 307 and 308)
- **General Facilities** – boardrooms, meeting rooms, common and recreation spaces (TEFMA codes 601, 604 and 609).

This standards document, and the collection of standards to which it belongs, is aimed at providing clear guidance to contractors and staff engaged to undertake audiovisual installations in University teaching spaces and meeting rooms. The objectives of the standards documents are to ensure consistent interpretation of technical requirements and consistent delivery of fit-for-purpose and maintainable spaces.

The Project Delivery Guidelines have been prepared in consultation with Curtin University subject matter experts and stakeholders. It is recognised that the subject matter of Guidelines will not always be suitable for all project elements and departures from the Guidelines may be required or desirable. Departures from Guidelines must be agreed upon in consultation with the relevant University Guideline subject matter expert. Departures must be recorded in a project register and recorded and reviewed in the Project Control Group meeting minutes under its own meeting agenda item "Project Delivery Guideline Departures". Where the University subject matter expert identifies that a departure adds ongoing value to the University, the subject matter expert will update the relevant Guideline.

The definitions that apply to this document are listed in the Glossary of Terms in Appendix B.

1.2 DOCUMENT ACCESS

All Curtin IT Services staff and contracted personnel are provided with access to this document.

Designers, installers and contractors must ensure they have the most current version of all standards prior to engaging in any work.

The most recent version of this document can be found on the web at: https://properties.curtin.edu.au/workingwithus/guidelines.cfm.

1.3 ROLES AND RESPONSIBILITIES

The following table outlines the responsibilities of roles relating to the upkeep and maintenance of the room and system configurations described in this document.

Table 1: Roles and Responsibilities

Role	Responsibility
AV Standards Manager	Owner of the document. Maintains currency and approvals through document control and versioning.
AV Project Staff and Consultants	Use the taxonomy (Appendix A) and standard room configurations (Table 17) when developing client briefs and designs.
Portfolio and Project Managers (PF&D)	Read and understand the taxonomy (Appendix A) and standard room configurations (Table 17).
Scheduling Staff	Use the taxonomy (Appendix A) and standard room configurations (Table 17) in scheduling systems, requests and training. Contribute to maintaining document currency.
CTL Staff	Use the taxonomy (Appendix A) and standard room configurations (Table 17) when training and dealing with academic staff. Contribute to maintaining document currency.

2 REQUIREMENTS

2.1 HIGH-LEVEL FUNCTIONAL REQUIREMENTS

The high-level functional requirements to achieve the teaching and learning business goals, and generally meet the needs of facilitators and participants in teaching and meeting venues, are shown in **Table 2**. The generic term 'facilitator' is used to mean lecturer, tutor or presenter in a teaching space and chairman or presenter in a meeting space. The term 'participant' is used for any other occupant of the venue, such as students in teaching spaces.

Table 2: High-level Functional Requirements

ID	Requirement Name	Description
FR01	Presentation Functions	The facilitator using the audiovisual system in a venue is able to display prepared presentation media (e.g. slides, websites, etc.)
FR02	Interactive Presentation Functions	The facilitator using the audiovisual system in a venue is able to display and annotate presentation media dynamically (e.g. an interactive whiteboard).
FR03	Collaboration Functions	The facilitator and participants using the audiovisual system in a venue are able to create and interact with teaching artefacts together in mixed groups.
FR04	Distribution Functions	The facilitator using the audiovisual system is able to communicate with remote participants and share/receive presentations.
FR05	Presentation Media	The facilitator using the audiovisual system in a venue is able to access a variety of source equipment and devices to create and/or display presentation media.
FR06	Session Capture and Store	The audiovisual system in a venue is able to record proceedings and securely store session artefacts.
FR07	AV Interface Panel	The facilitator of the audiovisual system in a venue is able to easily control functionality with a minimum of training.
FR08	Venue Furnishings	The venue provides furnishings that assist its effective use as a teaching and learning or meeting space.
FR09	Venue Acoustics and Lighting	The venue should not allow or cause distraction due to irrelevant noise and/or light sources.

ID	Requirement Name	Description
FR10	Disability Access	The facilitator and participants should have equality of access to the audio and visual learning resources.

2.2 FUNCTIONAL REQUIREMENTS

The detailed functional requirements to meet the high-level requirements of Section 2.1 are described in the following tables.

2.2.1 FR01 – PRESENTATION FUNCTIONS

With access to presentation functions, the facilitator is able to utilise the audiovisual system in a teaching or meeting space to display presentation media prepared before the session.

Table 3: Presentation Functional Requirements

ID	Description
PR01	The facilitator is able to display an image of presentation media that is visible to all participants.
PR02	The facilitator is able to display a secondary image of presentation media (different from the primary) that is visible to all participants.
PR03	The facilitator is able to amplify their own spoken voice so that it is audible to all venue occupants when: a. in a fixed location e.g. behind a lectern, sitting a table b. moving around the venue.
PR04	The facilitator is able to amplify sound from presentation media so that it is audible to all participants.
PR05	The facilitator is able to amplify a spoken voice from a seated participant so that it is audible to all participants (with a mute option for privacy as required).
PR06	The facilitator is able to control lighting using separate zones for presentation and audience zones.
PR07	The facilitator is able to view an image of the presentation media while facing towards the audience.
PR08	The facilitator is able to freeze and/or capture an image on the primary and/or secondary display.

2.2.2 FR02 – INTERACTIVE PRESENTATION FUNCTIONS

With access to interactive presentation functions, the facilitator is able to utilise the audiovisual system to display and annotate presentation media dynamically during the session.

Table 4: Interactive Presentation Functional Requirements

ID	Description
IN01	The facilitator is able to annotate over the primary displayed image using a pen device.
IN02	The facilitator is able to control the resident computer using finger touch or pen device.
IN03	The facilitator is able to control the resident computer using a remote hand controlled device (wireless presenter remote).
IN04	The facilitator is able to control the venue audiovisual system from a portable wireless device.

2.2.3 FR03 – COLLABORATIVE FUNCTIONS

With access to collaboration functions, the facilitator and participants utilise the audiovisual system to create and interact with teaching artefacts together in groups of mixed sizes.

Table 5: Collaboration Functional Requirements

ID	Description
CB01	The participant (student) group is able to work collaboratively on an in-venue group computer using standard enterprise applications (e.g. MS Office) and resources on the internet. The shared computer display is suitable for the group size.
CB02	The facilitator is able to direct the video and audio of the primary venue display to all in-venue shared group computers.
CB03	The facilitator is able to direct the video and audio of a selected in-venue group computer to the primary venue display.
CB04	The facilitator is able to direct the video and audio of a selected in-venue group computer to all other group computers.
CB05	The participant (student) group is able to work collaboratively on BYO computing devices such as laptops, tablets, smart phones and display on the group display (requires HDMI cable and/or adapter) .
CB06	The participant is able to display/share created learning materials from BYO computing devices onto the venue display using wireless connection (with consideration for Windows, iOS and Android devices).
CB07	The participant (student) group is able to work collaboratively on a shared group traditional whiteboard.

CB08	The participant (student) group is able to work collaboratively on a shared group interactive whiteboard.
CS09	Participant (student) groups are able to amplify voice so that it is audible to all venue occupants (with mute option). The facilitator is able to mute selected/all groups.

2.2.4 FR04 – DISTRIBUTION FUNCTIONS (VIDEO AND WEB CONFERENCING)

With access to distribution functions, the facilitator uses the audiovisual system to interact with remote participants, including the ability to share and/or receive presentations. There are two general options for the distribution mode – videoconferencing (VC) and web conferencing (WC) – that are described in the Glossary of Terms in Appendix B. Videoconferencing is generally the more advanced option, requiring a similarly configured venue for the remote venues.

Table 6: Distribution Functional Requirements

ID	Description
DM01 (VC)	The facilitator is able to conduct a session using in-house videoconferencing facilities to connect to another videoconferencing venue using standard protocols.
DM02 (VC)	The facilitator is able to conduct a session using in-house videoconferencing facilities to connect to participants joining the session using either videoconferencing facilities or a standard web browser.
DM03 (WC)	The facilitator is able to use a resident computer to connect to a virtual meeting/learning space using a standard web browser (preferably) or a proprietary client.
DM04	The facilitator is able to use live streaming to make video and audio available to another venue or remote participants.
DM05 (VC & WC)	The facilitator is able to present from an optimal 'capture position' for audio and video transmission to remote participants (lecture capture microphone, preset fixed camera).
DM06 (VC & WC)	The facilitator is able to move around a larger (but specified) 'capture zone' when presenting audio and video transmission to remote participants (using a wireless microphone for audio and an auto-tracking camera for video).
DM07 (VC)	The facilitator is able to select the inclusion of audience audio (e.g. student questions) for remote participants.
DM08 (VC)	The facilitator is able to allow a student/group/audience camera view (from within the specified 'capture zone') to be sent to remote participants.

DM09 (VC & WC)	The facilitator is able to send the presentation media, including audio from the primary projected image, to remote participants.
DM10 (VC & WC)	The facilitator and local participants are able to view 'talking head' video and listen to audio from remote participants.
DM11 (VC & WC)	The facilitator and participants are able to view presentation media (including audio) from remote participants.

2.2.5 FR05 – PRESENTATION MEDIA

The requirements regarding presentation media are concerned with using the audiovisual system to access a variety of source equipment and devices to create and/or display presentation media.

Table 7: Presentation Media Requirements

ID	Description
PM01	The facilitator is able to create and/or display presentation media using standard enterprise applications (e.g. MS Office) and resources on the internet.
PM02	The facilitator is able to display presentation media on physical electronic media devices – USB portable drives, DVDs.
PM03	The facilitator is able to display presentation media from BYO computing devices such as laptops, tablets, smart phones using: a. HDMI cable b. VGA cable and audio mini-jack (legacy).
PM04	The facilitator is able to display presentation media from BYO computing devices using wireless connection (optimally with native screen mirroring) for: a. laptop – Windows/Macintosh OS b. mobile – Apple iOS/Android OS
PM05	The facilitator is able to access presentation media across a network such as home directories, learning management systems (e.g. Blackboard), cloud-based shares and websites.
PM06	The facilitator is able to create handwritten and/or display printed presentation media or small physical objects (e.g. document camera).
PM07	The facilitator is able to display experiments or actions on a larger working area (e.g. up to 600 x 900 mm).

PM08	The facilitator is able to display commercial media on a resident media player: a. Blu-ray b. DVD.
PM09	The facilitator is able to display live or recorded broadcasts: a. television tuner b. streaming video receiver.

2.2.6 FR06 – SESSION CAPTURE AND STORE

The session capture and store requirements are concerned with being able to record proceedings and securely store session artefacts.

Table 8: Session Capture and Store Requirements

ID	Description
SC01	The facilitator is able to capture session proceedings including the primary displayed image of teaching materials and venue audio (e.g. microphone/program) i.e. single channel recording.
SC02	The facilitator or participant is able to capture a 'talking head' from a single 'capture position' simultaneously with the primary displayed image i.e. dual channel recording.
SC03	As for SC02, but the facilitator or participant is able to move around the venue and still be captured (e.g. using a wireless microphone for audio and an auto-tracking camera for video).
SC04	As for SC02, but with dynamic/automated switching between facilitator and student cameras.
SC05	As for SC02, but the facilitator is able to dynamically select between the 'talking head 'and a secondary displayed image.
SC06	The facilitator is able to select the inclusion of audience audio into the session capture (e.g. student questions).
SC07	The facilitator and/or participants are able to store constructed content and media to a shared repository (e.g. network drive or cloud store).
SC08	The facilitator is able to capture video, audio and presentation media of individual and group assessments to a secure repository (e.g. Echo 360 with links in the Learning Management System).

2.2.7 FR07 – AV INTERFACE PANEL

The AV interface panel requirements are concerned with the facilitator being able to easily control audiovisual functionality within the venue.

Table 9: AV Interface Panel Requirements

ID	Description
UI01	The facilitator is able to easily manage the venue audiovisual system from a single control interface, including controls/buttons for: • system on/off • source for projected image • volume levels and muting.
UI02	In venues that support multiple functionality, the facilitator can preselect the mode required and the AV system panel will display relevant controls e.g. presentation mode, videoconferencing mode and web conferencing mode.
UI03	The facilitator is able to access more advanced audiovisual controls, depending on venue type. For example, a. lighting and/or blind presets b. session capture c. video and web conferencing d. pod computer display.
UI04	The facilitator is able to request assistance directly from the audiovisual control interface.

2.2.8 FR08 – VENUE FURNISHINGS

The venue furnishing requirements are about providing furnishings that assist the effective use as a teaching and learning or meeting space.

Table 10: Venue Furnishing Requirements

ID	Description
FN01	The venue has a single location, usually the AVIP, for audiovisual resources such as resident computer, control panel, microphone docking station.
FN02	The facilitator is able to plug in a portable device to an accessible switched power point on the AVIP.
FN03	Participants are able to plug in portable devices to an accessible switched power point without creating an OHS hazard near student seating (not under whiteboards and projection screens).

FN04	A traditional whiteboard is available and the facilitator is able to write with standard erasable pens. The whiteboard writing surface must be high quality and allow easy and clean erasure. Whiteboard erasers are to be available near the whiteboard.
FN05	The facilitator is able to quickly and easily rearrange the seating and/or table configuration to suit pedagogical requirements.
FN06	The facilitator has an adequate clear and flat surface on or near the AVIP to layout teaching books and materials.
FN07	Shelving or a storage cabinet is to be provided for resources where possible.
FN08	For venues with videoconferencing facilities requiring a camera view of the audience, seating is arranged, or can be easily arranged, to allow capture of all participants.

2.2.9 FR09 – VENUE ACOUSTICS AND LIGHTING

This set of requirements is concerned with ensuring the venue does not allow or cause distraction due to irrelevant noise and/or light sources.

Table 11: Venue Acoustics and Lighting Requirements

ID	Description
AL01	Venues are adequately soundproofed against external noise.
AL02	The facilitator and/or audience are provided with a suitable level of privacy, with conversations not audible outside the venue.
AL03	The venue design/configuration and window treatments must limit sunlight and other light sources from reducing the quality of projected images.
AL04	For venues with videoconferencing facilities, lighting and contrasts are suitable for broadcast quality video (especially for the facilitator and the 'capture position').
AL05	For lecture theatres and venues with videoconference facilities, the audio is acoustically proven (minimal echo, feedback, distracting audible artefacts) to be suitable for broadcast quality audio.

2.2.10 FR10 – DISABILITY ACCESS

The disability access requirements are listed to ensure that the facilitator and participants have equality of access to the audio and visual learning resources.

Table 12: Disability Access Requirements

ID	Description

DA01	A facilitator and/or audience with hearing impairment are able to access audio through a hearing augmentation system to the extent required by the Building Code of Australia (BCA).
DA02	A facilitator with mobility impairment is able to equitably access all audiovisual system controls and facilities (e.g. touch panel, document camera).
DA03	A participant with mobility impairment is able to equitably access all collaborative features (e.g. interactive screens).

2.3 NON-FUNCTIONAL REQUIREMENTS

Non-functional requirements are used to judge the operation of a system, rather than defining specific functions or behaviours. These requirements are described in the following tables under the categories of system, support and infrastructure.

2.3.1 SYSTEM

Table 13: System Requirements

ID	Description
SY01	Widescreen: 16:9 (preferred) or 16:10 aspect ratio for all displays in the same venue.
SY02	Resolution: full HD or WUXGA (preferred), 1280 x 720 (minimum).
SY03	Panels: commercial grade fluorescent backlit LCD (preferred). Projectors: Lampless laser (preferred).
SY04	Rack location: core switch, processing and amplification equipment to be housed in a central service room (preferred) if project allows, otherwise AVIP or local venue rack (least preferred).
SY05	Energy efficiency: AV system shall power up/down (or leave/enter stand-by mode) when commanded at session start and automatically two hours after session end (inactivity).
SY06	Broadcast TV: where installed, IPTV distribution over ethernet (preferred), RF TV cabling and receiver to be considered as legacy.

2.3.2 SUPPORT

Table 14: Venue Support Requirements

ID	Description
VS01	The facilitator is able to contact the venue support team using a telephone located close to the audiovisual system control interface.

VS02	The support team is able to connect to the audiovisual system via IP for remote diagnostics and control of venue.
VS03	The support team is able to connect to the venue support camera via IP for remote monitoring.
VS04	The AV system is able to be remotely monitored, controlled, configured and updated from a central management system, including the ability to remotely reboot systems and power-cycle individual components.
VS05	The support team is able to provide secure I/O patch points to the venue AV system for external parties (e.g. news team, conference staging companies), including wireless control of the AV system when the lectern is removed.
VS06	The support team has access to spares for critical AV system components or is able to source like-for-like replacements in a reasonable timeframe.
VS07	AV system components are compatible with the bill of materials for a similar room configuration in current standard.
VS08	The user interface is compatible with the graphics and function of a similar room configuration in current standard.

2.3.3 INFRASTRUCTURE

Table 15: Infrastructure Requirements

ID	Description
IF01	Wireless access: There is at least one access point (AP) for each 50 seats of capacity (may need to consider APs in nearby venues).
IF02	Projection surface: expansive matt white wall with no defined borders (preferred), or motorised screens. Pull-down screen/s to be considered as legacy.
IF03	Lockable doors: cabinetry doors for CITS/AV access only are to have BMBA025 locking mechanism.
IF04	Physical security: all exposed and accessible AV equipment is to be securely installed with approved mounting brackets with locks or locking mechanisms.

2.4 ENABLEMENT OF FUNCTIONAL REQUIREMENTS

The functional requirements described in Section 2.2 are enabled by the room and system features as shown in **Table 16**.

Table 16: Functional Requirements as enabled by Room and System Features

High-level Requirement / Feature	FR01	FR02	FR03	FR04	FR05	FR06	FR07	FR08	FR09	FR10
Presentation										
Projector/FPD (single) – primary media display	PR 01									
Projector/FPD (multiple) – primary/secondary media display	PR 02			DM 10 11						
Interactive surface		IN 01 02	CB 08							DA 03
Document camera					PM 06 07					
Lectern								FN 01 02 06		DA 02
Media input – HDMI cable			CB 05		PM 03					
Media input – wireless connection			CB 06		PM 04					
Whiteboard			CB 07					FN 04		

High-level Requirement / Feature	FR01	FR02	FR03	FR04	FR05	FR06	FR07	FR08	FR09	FR10
Confidence monitor	PR 07									
Wireless presenter remote		IN 03								
Audio										
Microphones – fixed (lectern/ceiling)	PR 03			DM 01 02		SC 01				
Microphone(s) – wireless	PR 03			DM 06		SC 03				
Microphone(s) – audience (ceiling)	PR 05		CB 09	DM 07		SC 06				
Microphone(s) – table/pods	PR 05		CB 09							
Voice amplification (including hearing augmentation)	PR 04									DA 01
Audio amplification	PR 03									
Venue speakers – wall or ceiling mounted	PR 03 04			DM 10 11						
Video										
Lecturer camera – fixed				DM 01 02		SC 02				

High-level Requirement / Feature	FR01	FR02	FR03	FR04	FR05	FR06	FR07	FR08	FR09	FR10
Lecturer camera – motion tracking				DM 06		SC 03				
Homing device – lecturer camera				DM 05						
Student camera – voice tracking				DM 08						
Smart camera switching (using audio inputs)				DM 08		SC 04				
Venue Computers										
Resident computer				DM 09	PM 01 02	SC 07				
Student computers – group (pod)			CB 01							
Student computers – individual			CB 01							
Screen sharing (e.g. Vuepoint/Faronics application)			CB 02 03 04							
Distribution										
Wired network ports					PM 05	SC 07				
Wireless network access			CB 06		PM 04					

High-level Requirement / Feature	FR01	FR02	FR03	FR04	FR05	FR06	FR07	FR08	FR09	FR10
Webcam with inbuilt microphone				DM 03						
Web conference enabled (lecturer camera and audio to computer)				DM 03						
Videoconference enabled (all cameras and audio to VC hardware)				DM 01 02						
Web conference gateway (e.g. WebEx)				DM 02						
Capture										
iLecture – primary media display, lecturer camera, audio						SC 01 02 08				
Web streaming				DM 04						
Furnishings										
Fixed tables/seating – tiered										
Fixed tables – flat floor								FN 08		
Non-fixed tables – flat floor								FN 08		
Fully flexible – wheeled furniture								FN 05		

High-level Requirement / Feature	FR01	FR02	FR03	FR04	FR05	FR06	FR07	FR08	FR09	FR10
Control										
Keypad controller							UI 01			
Touch panel with system control	PR 06 08		CB 08			SC 05	UI 01 02 03 04			
Remote touch panel (iPad)		IN 04					UI 02 03			
Lighting control from touch panel	PR 06						UI 03		AL 03	

3 ROOM CONFIGURATION PACKAGES

3.1 CONFIGURATION CODE

Each room configuration package is described by a code of the following form:

<mode><number>-<variant>

where,

<mode> indicates the main pedagogy or type of use

LEC = lecture/tutorial

CLB = collaboration

MET = meeting

RFP = reflective practice

DSS = digital signage

<number> is the subtype of the configuration package

<variant> indicates an established package variation

e.g. COM = computer suite.

3.2 STANDARD ROOM CONFIGURATION PACKAGES

The standard room configuration packages with allowable variants and options are described in **Table 17**.

Table 17: Standard Room Configuration Packages with Variants

Config. Code	Title	Description	Variants
Lecture Theatres and Tutorials Classrooms			
LEC01	Huddle Space	single source FPD display, keypad control	
LEC02	Flat Floor Tutorial – Basic	single source projector display, touch panel control	COM = computer suite
LEC03	Flat Floor Tutorial – iLecture	single source projector display, document camera, lecture capture	
LEC04	Tiered Lecture Theatre	interactive tablet, single source projector display, document camera, lecture capture	
LEC05	Tiered Lecture Theatre & Events (Premium)	interactive tablet, dual source projector display, document	

Config. Code	Title	Description	Variants
		camera, lecture capture, event inputs	
Mixed-Group Collaborative Classrooms			
CLB01	Collaborative Classroom – Basic	interactive tablet, dual source projector display, document camera, lecture capture, flexible furniture	
Small-Group Collaborative Classrooms			
CLB02	Collaborative Classroom with Pod Computers	interactive tablet, dual source projector display, document camera, lecture capture, small group computers	PDD = pod dual display
Distributed Learning Collaborative Classrooms			
CLB03	Collaborative Classroom with Video Conferencing and Pod Computers	interactive tablet, dual source projector display, document camera, lecture capture, small group computers, videoconference endpoint, fixed furniture	SF = semi-flexible furniture FF = fully flexible furniture (and no Pod computers)
Meeting Spaces			
MET01	Meeting Space – Huddle	single FPD, wireless presentation endpoint	IWB = interactive wall board
MET02	Meeting Space – Basic	single FPD, resident computer, wireless presentation endpoint	MIC = table microphones
MET03	Meeting Space with Video Conferencing	dual FPD, resident computer, wireless presentation endpoint, videoconference endpoint	
MET04	Open Event Space	large format display, resident computer, wireless presentation endpoint, speech reinforcement	
Reflective Practice			
RFP01	Reflective Practice - Basic	Resident computer, camera(s) and microphone with local ad hoc capture	USB = USB cameras
RFP02	Reflective Practice - Monitored	Resident computer, camera(s) and microphone with local ad hoc	

Config. Code	Title	Description	Variants
		capture. Monitored from control room	
Digital Signage			
DSS01	Digital Signage	single FPD, digital media player	

4 SYSTEM DESCRIPTIONS

4.1 TEACHING AND LEARNING SPACE DESCRIPTIONS

A comparison of the standard room configuration packages for teaching and learning spaces is shown in the room and system feature matrix of **Table 18**.

Table 18: Room and System Feature Matrix for Teaching and Learning Spaces

Standard Room Package / Feature	LEC01	LEC02	LEC03	LEC04	LEC05	CLB01	CLB02	CLB03	CLB03-SF	CLB03-FF
Presentation										
Projector/FPD (single) - primary media display	✓	✓	✓	✓						
Projector/FPD (multiple) - primary/secondary media display					✓	✓	✓	✓	✓	✓
Interactive surface	O	O	O	✓	✓	✓	✓	✓	✓	✓
Document camera			✓	✓	✓	✓	✓	✓	✓	✓
Lectern		✓	✓	✓	✓	✓	✓	✓	✓	✓
Media input – HDMI cable	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Media input – wireless connection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Whiteboard	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Confidence monitor					✓			✓	✓	✓
Wireless presenter remote					✓					

Standard Room Package / Feature	LEC01	LEC02	LEC03	LEC04	LEC05	CLB01	CLB02	CLB03	CLB03-SF	CLB03-FF
Audio										
Microphones – fixed (lectern/ceiling)			✓	✓	✓	✓	✓	✓	✓	✓
Microphone(s) – wireless			✓	✓	✓	✓	✓	✓	✓	✓
Microphone(s) – audience (ceiling)									✓	✓
Microphone(s) – table/pods								✓		
Voice amplification (including hearing augmentation)			O	✓	✓	O	O	O	O	O
Audio amplification	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Venue speakers – wall or ceiling mounted		✓	✓	✓	✓	✓	✓	✓	✓	✓
Video										
Lecturer camera – fixed			A	A	A					
Lecturer camera – motion tracking			A	A	A	✓	✓	✓	✓	✓
Homing device – lecturer camera			✓	✓	✓	✓	✓	✓	✓	✓
Student camera – fixed			O	O	O	✓	✓	A	A	A
Student camera – voice tracking								A	A	A
Smart camera switching (using audio inputs)								✓	✓	✓

Standard Room Package Feature	LEC01	LEC02	LEC03	LEC04	LEC05	CLB01	CLB02	CLB03	CLB03-SF	CLB03-FF
Venue Computers										
Resident computer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Student computers – group (pod)							✓	✓	✓	
Student computers – individual		O								
Screen sharing (e.g. Vuepoint/Faronics application)							✓	✓	✓	
Distribution										
Wired network ports	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wireless network access	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Webcam with inbuilt microphone	✓	O								
Web conference enabled (camera and audio to computer)			O	A	A	✓	✓	✓	✓	✓
Video conference enabled (cameras and audio to VC hardware)				A	A			✓	✓	✓
Capture										
iLecture – primary media display, lecturer camera, audio			✓	✓	✓	✓	✓	✓	✓	✓
Web streaming			✓	✓	✓	✓	✓	✓	✓	✓

Standard Room Package / Feature	LEC01	LEC02	LEC03	LEC04	LEC05	CLB01	CLB02	CLB03	CLB03-SF	CLB03-FF
Furnishings										
Fixed tables/seating – tiered				✓	✓					
Fixed tables – flat floor								✓		
Non-fixed tables – flat floor	A	A	A				A		✓	
Fully flexible – wheeled furniture	A	A	A			✓	A			✓
Control										
Keypad controller	✓									
Touch panel with system control		✓	✓	✓	✓	✓	✓	✓	✓	✓
Remote touch panel (iPad)							O	O	O	O
Lighting control from touch panel			O	✓	✓	O	O	✓	✓	✓

Key:
✓ = Mandatory, O = Optional, A = Alternative

4.1.1 LECTURE THEATRES AND TUTORIAL CLASSROOMS

LEC01 – HUDDLE SPACE

The huddle space has less than eight seats with flexible furniture. The audiovisual system consists of a flat panel display able to show a single source of media at a time, a resident computer, wired and wireless inputs and basic audio amplification of media, and keypad controller.

LEC02 – FLAT FLOOR TUTORIAL – BASIC

The traditional tutorial classroom is flat floored with tables and seating normally arranged facing a presentation wall. The furniture can be rearranged with some effort. The audiovisual system consists of a data projector or flat panel display able to display

a single source of media at a time, a resident computer, wired and wireless inputs and basic audio amplification of media and touch panel.

LEC02-COM – COMPUTER LABORATORY VARIANT OF FLAT FLOOR TUTORIAL – BASIC

Based on the LEC02, the traditional computer suite is flat floored with computer benches and seating normally arranged facing a presentation wall.

LEC03 – FLAT FLOOR TUTORIAL – ILECTURE

The audiovisual system in this traditional tutorial classroom is more advanced than the LEC02 design as iLecture elements are introduced to allow session capture. The system consists of a data projector able to display a single source of media at a time, a resident computer, document camera, wired and wireless inputs, microphones, lecturer camera and a capture appliance.

LEC04 – LECTURE THEATRE TIERED

The tiered lecture theatre is a variant of the tutorial flat floor design where the fixed seating arrangement, and generally larger size of the venue (higher ceilings, larger lectern, more powerful speakers) need to be taken into consideration when accommodating the design into the space. There is a lectern at the front establishing a clear separation between presenter and participants. There is need for voice amplification in the larger space.

LEC05 – LECTURE THEATRE TIERED AND EVENTS (PREMIUM)

The premium lecture theatre or event space is a variant of the LEC04 where a secondary source projector, interactive and event interface inputs are added to the design.

For specific detail on design refer to *000317 PDG Audiovisual Guidelines Part 4– Detailed Design Specifications.*

4.1.2 MIXED GROUP COLLABORATIVE CLASSROOMS

CLB01 – MIXED GROUP COLLABORATIVE

A mixed group collaborative classroom has 'flexible furniture' meaning that the tables and chairs can be easily configured to suit the pedagogical needs – from whole group conversations (or case study) through to small group and individual work.

The audiovisual system has multiple projection surfaces, one of them interactive, with the ability to select from a large range of sources for primary and secondary presentation. Other presentation elements include a resident computer, document camera, wired and wireless inputs. The iLecture and web conferencing elements include microphones, auto tracking lecturer camera, pressure mat and a capture appliance.

4.1.3 SMALL GROUP COLLABORATIVE CLASSROOMS

CLB02 – SMALL GROUP COLLABORATIVE WITH GROUP COMPUTERS

A small group collaborative classroom has 'semi-flexible furniture', meaning that the tables and chairs are generally arranged around group computers for small group collaborative work but can be easily configured to suit the other pedagogical needs.

The audiovisual system is similar to CLB01 with the necessary additions to accommodate the screen sharing for the group computers.

CLB02–PDD – DUAL DISPLAY VARIANT OF SMALL GROUP COLLABORATIVE WITH GROUP COMPUTERS

The 'pod dual display' variant of the small group collaborative classroom has group location ('pod') with dual LCD displays above the group computer. The lower display is connected to the group computer. The upper display is connected to the multiple sources of the AV system through a video encoder/decoder arrangement. The facilitator is able to select a range of display combinations including 'primary to all', 'selected pod to all' and 'selected pod to primary'.

For specific detail on design refer to *000317 PDG Audiovisual Guidelines Part 4– Detailed Design Specifications.*

4.1.4 DISTRIBUTED LEARNING COLLABORATIVE CLASSROOMS

CLB03 – COLLABORATIVE CLASSROOM WITH VIDEOCONFERENCING AND POD COMPUTERS

This distributed learning collaborative classroom has 'fixed furniture', meaning that the tables and chairs are deliberately arranged around group computers for small group collaborative work with suitable camera angles for remote discussions through videoconferencing. There are multiple projection surfaces for the display of presentation media and videoconference participants.

The audiovisual system has multiple projection surfaces, one of them interactive, with the ability to select from a large range of sources for primary and secondary presentation. Other presentation elements include a resident computer, document camera, wired and wireless inputs. The iLecture and videoconferencing elements include microphones, auto tracking lecturer and student cameras, pressure mat, and a capture appliance. Table microphones are placed at each group (pod) location. Web conferencing is available through the auto tracking lecturer camera and microphones connected to the resident computer.

CLB03–SF – SEMI-FLEXIBLE FURNITURE VARIANT OF COLLABORATIVE CLASSROOM WITH VIDEOCONFERENCING, AND POD COMPUTERS

The 'semi-flexible furniture' variant of the CLB03 classroom has tables and chairs that are generally arranged around the group computers for small group collaborative work but can be easily configured to suit the other requirements. The table microphones and the group location (pods) are replaced with ceiling microphones in the same vicinity.

CLB03–FF – Fully-flexible Furniture Variant of Collaborative Classroom with Videoconferencing

The 'fully-flexible furniture' variant of the CLB03 classroom has tables and chairs that can be easily configured to suit the pedagogical needs, from whole group conversations (or case study) through to small group and individual work. The group computers and table microphones are removed from the design. Ceiling microphones are located for optimal pickup across the venue's floor space.

For specific detail on the design, refer to *000317 PDG Audiovisual Guidelines Part 4– Detailed Design Specifications.*

4.2 MEETING SPACE DESCRIPTIONS

A comparison of the standard room configuration packages for meeting spaces is shown in the room and system feature matrix of **Table 19**.

Table 19: Room and System Feature Matrix for Meeting Spaces

Standard Room Package / Feature	MET01	MET02	MET02-MIC	MET03	MET04	RFP01	RFP02	DSS01
Presentation								
Projector/FPD (single) – primary media display	✓	✓	✓		✓			✓
Projector/FPD (multiple) – primary/secondary media display				✓				
Interactive surface		O	O	O				
Document camera								
Lectern								
Media input – HDMI cable	✓	✓	✓	✓	✓			
Media input – wireless connection	✓	✓	✓	✓	✓			
Whiteboard								
Confidence monitor								
Wireless presenter remote								

Standard Room Package / Feature	MET01	MET02	MET02-MIC	MET03	MET04	RFP01	RFP02	DSS01
Audio								
Microphones – fixed (lectern/ceiling)						A	A	
Microphone(s) – wireless					✓			
Microphone(s) – audience (ceiling)								
Microphone(s) – table/pods		O	✓	✓		A	A	
Voice amplification (including hearing augmentation)					✓			
Audio amplification					✓			
Venue speakers – wall or ceiling mounted		✓	✓	✓	✓		✓	
Video								
Lecturer camera – fixed		✓	✓			✓	✓	
Lecturer camera – motion tracking				✓				
Homing device – lecturer camera								
Student camera – voice tracking								
Smart camera switching (using audio inputs)								
Venue Computers								
Resident computer	O	✓	✓	✓	✓	✓	✓	
Student computers – group (pod)								
Digital media player					✓			✓

Standard Room Package / Feature	MET01	MET02	MET02-MIC	MET03	MET04	RFP01	RFP02	DSS01
Screen sharing (e.g. Vuepoint/Faronics application)								
Distribution								
Wired network ports	✓	✓	✓	✓	✓	✓	✓	✓
Wireless network access	✓	✓	✓	✓	✓			
Webcam with inbuilt microphone	✓				✓			
Web conference enabled (lecturer camera and audio to computer)		✓	✓					
Videoconference enabled (all cameras and audio to VC hardware)				✓				
Capture								
iLecture - primary media display, lecturer camera, audio						✓	✓	
Web streaming								
Furnishings								
Fixed tables/seating – tiered								
Fixed tables – flat floor		A	✓	✓				
Non-fixed tables – flat floor	A	A			A	A	A	
Fully flexible – wheeled furniture	A				A	A	A	
Control								
Keypad controller	✓					✓		

Standard Room Package / Feature	MET01	MET02	MET02-MIC	MET03	MET04	RFP01	RFP02	DSS01
Touch panel with system control		✓	✓	✓	✓		✓	
Remote touch panel (iPad)								

Key:
✓ = Mandatory, O = Optional, A = Alternative

4.2.1 MEETING SPACES

A meeting space consists of one or more display surfaces (usually LCD screens) with a small set of presentation or media sources – ranging from BYOD for simple 'huddle' spaces to videoconferencing for a premium venue.

MET01 – MEETING HUDDLE SPACE

The meeting huddle space generally has a non-fixed arrangement of a table and less than eight seats. The audiovisual system consists of a flat panel display able to show a BYO media device connected using the wired or wireless inputs, basic audio amplification, and keypad controller.

MET01-IWB – SMALL MEETING SPACE WITH INTERACTIVE WALL BOARD

This variant of the small meeting space generally has a non-fixed arrangement of a table and less than eight seats. The audiovisual system consists of an interactive wall board able to show a BYO media device connected using the wired or wireless inputs, web/videoconferencing with basic audio amplification.

MET02 – MEETING SPACE WITH RESIDENT PC

This meeting space consists of a semi-permanent table with between 8 and 20 seats. The audiovisual system consists of a data projector or flat panel display (optionally interactive) able to display the resident computer or BYO media device connected using the wired or wireless inputs, basic audio amplification, and a touch panel. The resident computer is web conference-enabled with camera and microphones.

MET03 – MEETING SPACE WITH RESIDENT PC AND VIDEOCONFERENCING

This meeting space consists of a fixed table with between 8 and 30 seats. The audiovisual system consists of two flat panel displays able to display the resident computer and/or BYO media device connected using the wired or wireless inputs, videoconference system with speaker tracking cameras, microphones, audio amplification, and a touch panel. The resident computer is web conference-enabled with camera and microphones.

MET04 – OPEN EVENT SPACE

The open event space has a large format presentation wall facing into a foyer or similar gathering area. The audiovisual system consists of a large format or matrix display able to display a single source of media at a time, a resident computer, wired and wireless inputs, digital signage player, speech and media amplification and a touch panel.

For specific detail on design refer to *000317 PDG Audiovisual Guidelines Part 4– Detailed Design Specifications.*

4.2.2 REFLECTIVE PRACTICE

A reflective practice venue provides a resident computer, local venue camera(s) and microphone(s) for ad hoc capture of a personal interactions or activity session. The capture media can be uploaded to personal storage devices or the enterprise lecture capture server for secure storage and assessment.

RFP01 – REFLECTIVE PRACTICE - BASIC

The venue can have a single camera, or dual cameras if required for greater field of view, reticulated into the resident computer via IP streaming or direct USB.

RFP02 – REFLECTIVE PRACTICE - MONITORED

The camera and audio can be monitored from a control room using a networked computer using proprietary software. An operator in the control room is able to provide audio communication into the venue.

For specific detail on design refer to *000317 PDG Audiovisual Guidelines Part 4 – Detailed Design Specifications.*

4.2.3 DIGITAL SIGNAGE

Digital signage is usually installed in areas such as public spaces, building entrances and reception areas. Digital signage installations generally consist of a flat panel display and a digital media player connected to power and a network outlet.

Content for the screen will be developed by the local area to which the installation belongs, using a proprietary application on a local computer. Provision should allow for the digital media player to be connected to a central digital signage server (future).

For specific detail on design refer to *000317 PDG Audiovisual Guidelines Part 4 – Detailed Design Specifications.*

5 APPENDICES

Appendix A : Taxonomy

ACTIVITIES

Teaching (Student One types)	Block Teaching Clinical Practice Computer Laboratory Fieldwork Individual Study Language Laboratory Lecture Online Class Practical Project Science Lab Seminar Studio Tutorial Workshop
Pedagogy	Case study Collaborative, whole group (case study) Collaborative, small group (learner-centred) Distributed (including remote participants) Informal learning Kinesthetic learning (tactile) Lecture (teacher-centred, didactic) Problem-based learning Reflective practice

COMPONENTS

Display	Projector, ceiling-mounted Projector, wall-mounted (short-throw) Projection screen, painted wall Projection screen, pull-down Projection screen, motorised Monitor (smaller LCD, usually table or arm-mounted) Flat panel display (larger LCD, wall-mounted) Smartboard
Seating	Ergonomic chair, mobile Ergonomic chair, fixed

	Tablet-arm (node) chair Booth seat
Work Surface	Table Workstation Tablet-arm (node) chair Booth table
Writing Surface	Whiteboard, fixed Whiteboard, mobile Touchscreen, flat panel display Touchscreen, tablet Touchscreen, projected image (e.g. Smartboard)

ATTRIBUTES

Access	Open Bookable Dedicated
Atmosphere	Formal (conventional setting) Informal (casual, social) Versatile (setting can be easily configured)
Audience	Undergraduate Postgraduate Faculty External/public Mixed
Enclosed	Open Partially enclosed Enclosed
Flexibility	Fixed (tiered or flat floor) Semi-flexible (moveable furniture) Flexible (very easy reconfiguration)
Group Size	Petite (1–12) Small (12–40), Curtin standard is 30 Medium (40–75), Curtin standard is 60 Large (75–150), Curtin standard is 90 Super (>150)
Ownership	CATS Faculty

Appendix B : Glossary of Terms

Term or Acronym	Definition
Archibus	Curtin's Enterprise Facilities Management System
AV	Audiovisual
AVIP	Audiovisual Interface Point (aka lectern)
Audiovisual (AV) System	All equipment integrated into the infrastructure necessary to fulfil the intent of communicating the audio and/or video content to an audience. It is a set of specified, individual audio and video components designed and configured to operate as one comprehensive system.
Audio	Any audio signal in either analog or digital format
BCA	Building Code of Australia
BYOD	Bring Your Own Device, e.g. laptop, tablet, smart phone
Capture	Recording the audio and video of session proceedings
CITS	Curtin Information Technology Services
CITS-AV	CITS Audiovisual (project and support team)
Data Projector	An electronic device capable of projecting an image from a computer or video source onto a large display screen
Distributed	The venue is enabled for interaction with remote participants including the ability to share and/or receive presentations.
Facilitator	The main user or controller of the audiovisual system. In a teaching space this may be the lecturer, tutor or presenter. In a meeting space this may be the chairperson or presenter
FOH	Front of House – the front of the space.
FPD	Flat panel display (larger LCDs are usually wall-mounted)
Full-HD	Full High Definition – a display image resolution of 1920 x 1080 (1080p)
HD	High Definition – a display image resolution at least 1080 x 720 (720p)
HDMI	High Definition Multimedia Interface – a connection type used for the delivery of high definition uncompressed digital data over short distances

Term or Acronym	Definition
iLecture	Curtin University's lecture capture and online media delivery system using Echo360 brand server and capture appliances
LCD	Liquid crystal display
Participant	An occupant of the venue. In a teaching space this may be a student or an audience member
Presentation Media	The teaching material or meeting documentation
PC	A personal computer, usually running under a Microsoft Windows platform
Resident Computer	An in-house computer hardwired into the AV system, usually installed in the lectern
Session	A scheduled or ad hoc teaching or meeting event
Source	A device or player that provides audio and/or video outputs for display through the venue's AV system
TEFMA	Tertiary Education Facilities Management Association
Video	Any video signal in either analog or digital format
Videoconferencing	An online connection of dispersed venues where the defining features are 'group attendance' and 'physical space'. Each venue uses a hardwired system of cameras, microphones and dedicated VC equipment to connect to other similarly configured remote venues.
Web Conferencing	An online meeting of dispersed participants where the defining features are 'individual attendance' and 'virtual space'. Each participant uses a standard web browser application on a computer with a webcam to connect to a virtual meeting room hosted by a cloud conferencing service.
WUXGA	A display image resolution of 1920 x 1200.