AUDIOVISUAL TECHNOLOGY CAPSTONE ~ CERT

INDUSTRY SECTOR: Information and Communication Technologies Sector

PATHWAY: Information Support and Services

CALPADS TITLE: Advanced Information Support Services (Capstone)

CALPADS CODE: 8112

HOURS:

Total	Classroom	Laboratory/CC/CVE
180	60	120

JOB TITLE	O*NET CODE	JOB TITLE	O*NET CODE
Electronic Home Entertainment Equipment Installers and Repairers	49-2097.00	Audio and Video Equipment Technicians	27-4011.00
Media and Communication Workers, All Other	27-3099.00	Sound Engineering Technicians	27-4014.00

COURSE DESCRIPTION:

The Audiovisual Technology (AV) Capstone course builds on the foundation skills from the essentials course and offers students an in-depth understanding of audio, visual, and audiovisual systems integration. Upon completion, students will be prepared for entry-level careers or further education in the AV industry. This course will challenge students to use their advanced skills to create and collaborate on projects, evaluate designs, build a portfolio, and plan for a career in the AV industry.

A-G APPROVAL: G

ARTICULATION: None

DUAL ENROLLMENT: None

PREREQUISITES:

Prerequisite
Audiovisual Technology Essentials

METHODS OF INSTRUCTION

- Direct instruction
- Group and individual applied projects
- Multimedia
- Demonstration
- Field trips
- Guest speakers

STUDENT EVALUATION:

- Student projects
- Written work
- Exams
- Observation record of student performance
- Completion of assignment

INDUSTRY CERTIFICATION:

- AVIXA AV Technologist Certificate, CTS

RECOMMENDED TEXTS:

- TBD - Books will change annually based on industry input
- Audiovisual Best Practices : The Design and Integration Process for the AV and Construction Industries

PROGRAM OF STUDY

Grade	Fall	Spring	Year	Course Type	Course Name
9, 10, 11				Concentrator	Audiovisual Technology Essentials
10, 11, 12				Capstone	Audiovisual Technology Capstone ~ CERT

I.	REVIEW OF AV EXPERIENCES	CR	Lab/CC	Standards
	In this course, students will expand upon the foundation skills learned in the essentials class. They will gain an in-depth understanding and hands-on experience with audio, visual, and audiovisual systems integration. This course will prepare students for entry-level careers or further education in the AV industry. Through advanced skill development, students will work on collaborative projects, evaluate designs, create a portfolio, and plan for a career in the AV industry. Students will create an AV Analysis and Critique project, students will choose a piece of audiovisual media and conduct an in-depth analysis and critique of its sound design, visual design, storytelling, audience engagement, and industry context. Students will take detailed notes on these elements while watching or playing the piece of media and then write a 3-5 page critique. The critique will be presented in class and discussed as a group. The project aims to develop critical thinking and analysis skills and will be graded based on the analysis and critique, writing and organization, and participation in class discussion. This project will be an opportunity for students to explore the media they are passionate about or that is relevant to their desired industry. Topics Covered: • The history of audiovisual technology and its evolution over time • The role of audiovisual equipment and techniques in various industries, such as film, television, music, and gaming • The different types of audiovisual equipment and their uses, such as cameras, microphones, lighting, and editing software • The principles of sound and image production, including composition, color theory, and sound design • The impact of emerging technologies on the audiovisual industry, such as virtual and augmented reality • The use of audiovisual elements in storytelling and audience engagement • Critique and analysis of various audiovisual works, such as films, television shows, and music videos • The role of audiovisual media in creating a sense of place and identity • The ethical and legal considerations surrounding the use of audiovisual media. Students will be able to: • Understand and analyze the different elements of audiovisual media, such as sound design, visual design, storytelling, and audience engagement. • Critique and evaluate the effectiveness of a piece of audiovisual media. • Apply industry trends and techniques to their own projects. • Create and work on collaborative projects. • Evaluate designs and create a portfolio of their work. • Plan and articulate a career path in the AV industry. • Participate in class discussions and presentations on audiovisual media. • Understand the ethical and legal considerations surrounding the use of audiovisual media. • Understand the impact of emerging technologies on the AV industry. • Understand the role of audiovisual media in creating a sense of place and identity. In conclusion, this unit is designed to provide students with a review of the understanding of the audiovisual industry and its various applications. The unit will also cover the history of AV technology, the impact of emerging technologies, and ethical and legal considerations in the industry. By the end of the unit, students will be able to analyze and critique various AV works, apply industry trends and techniques to their own projects	8	7	**Academic:** LS: 11-12.1, 11-12.2, 11-12.3, 11-12.6 RSIT: 11-12.7 WS: 11-12.7, 11-12.8 PE: 12.8, 12.8.2, 12.8.3 US: 11.8 WH: 10.11 **CTE Anchor:** Communications: 2.1, 2.6, 2.7, 2.8 Career Planning and Management: 3.2, 3.3, 3.6, 3.7 Technology: 4.1, 4.3, 4.5 Problem Solving and Critical Thinking: 5.1 Responsibility and Flexibility: 7.1, 7.5 Leadership and Teamwork: 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7 Demonstration and Application: 11.1 **CTE Pathway:** A1.1, A1.2, A2.1, A6.1, A7.3

II.	DIGITAL SIGNAGE	CR	Lab/CC	Standards
	This unit will introduce students to the concept of digital signage and its applications in various industries, with a focus on aligning with industry standards. Students will learn about the different types of digital signage, hardware and software requirements, content creation, management, and installation. They will also learn about the impact of emerging technologies on digital signage and the importance of user experience. Students will create a digital signage campaign for a local business or organization of their choice. They will be responsible for researching the target audience and identifying their needs and preferences, creating a content plan and schedule, designing the content using digital signage software, testing the campaign on a digital signage platform, and simulate the install of the digital signage hardware at the chosen location, following industry standards and guidelines. The students will present their campaign to the class for feedback and evaluation, discussing the challenges they faced and the solutions they found. Topics Covered: • Introduction to digital signage and industry standards • Types of digital signage and hardware requirements • Content creation, management, and installation • User experience design • Emerging technologies in digital signage • Digital signage in various industries • Legal and ethical considerations • Digital signage network management • Measurement and analytics of digital signage • Installation of digital signage hardware following industry standards What Students will be able to do after completing the unit: • Understand the different types of digital signage hardware and software • Create and schedule digital signage content • Research target audiences and create audience-specific content • Understand industry standards for installation and operation • Design, execute, and evaluate digital signage campaigns • Install and maintain digital signage hardware • Troubleshoot digital signage systems Overall, this unit will provide students with the knowledge and skills necessary to understand, create, manage, and install digital signage campaigns that align with industry standards and will prepare them for entry-level careers or continuing education in the digital signage industry.	10	20	**Academic:** LS: 11-12.1, 11-12.2 WS: 11-12.1 A-CED: 1 G-MG: 3 **CTE Anchor:** Communications: 2.2, 2.3 Career Planning and Management: 3.6 Technology: 4.1, 4.2, 4.5 Problem Solving and Critical Thinking: 5.1, 5.5, 5.7, 5.8 Health and Safety: 6.3, 6.6, 6.7, 6.8 Responsibility and Flexibility: 7.1, 7.6 Ethics and Legal Responsibilities: 8.1, 8.2, 8.7 Technical Knowledge and Skills: 10.9 **CTE Pathway:** A2.1, A2.2, A2.3, A2.4, A3.1, A3.3, A3.5, A5.1, A6.2, A8.1, A8.2
III.	APPLIED AV MATH PART 1	CR	Lab/CC	Standards
	In this unit, students will learn how to use math and industry standard formulas and how to use correct units of measure in the AV industry. Every image, screen and display has a specific size based on how it will be used. The ability to determine the size (aspect ratio) of any image, screen or display helps you buy the right product, match a projector's image to the correct screen size or select the correct image size for a given environment. Without a solid foundation in this area, costly errors can be made. Each student will work from a pre-defined set of project requirements to deliver a throw distance solution for a projector. Using applied math, the students will calculate the size of a projected image for height and farthest viewer by task. They will also describe the correct order of operations for the project and will provide a detailed explanation of the steps taken to arrive at the final solution. Topics Covered: • Applied math concepts in the AV industry • Aspect ratio and image size calculations	10	5	**Academic:** LS: 11-12.6 RSIT: 11-12.1 WS: 11-12.8 A-CED: 1 A-REI: 1 G-MG: 1 N-Q: 1 N-CN: 1 **CTE Anchor:** Communications: 2.4, 2.5 Technology: 4.1 Problem Solving and Critical Thinking: 5.1, 5.6,

- Throw distance and lens selection
- Projector placement and installation
- Units of measure and conversions
- Industry standard formulas and calculations
- Project management and order of operations

What Students will be able to do after completing the unit:

- Understand and apply math concepts in the AV industry
- Determine the size of an image, screen or display
- Select the appropriate projector and lens for a given space
- Properly place and install a projector
- Use industry standard formulas and calculations
- Understand and use correct units of measure
- Plan and execute a projector installation project with proper order of operations

Overall, this unit will provide students with the knowledge and skills necessary to understand and apply math concepts in the AV industry, to select the appropriate equipment and to plan and execute projects with proper order of operations.

		CR	Lab/CC	Standards
IV.	**APPLIED AV MATH PART 2**			

5.7, 5.8
Responsibility and Flexibility: 7.3
Technical Knowledge and Skills: 10.1, 10.1
CTE Pathway:
A2.1, A6.2, A8.1

		CR	Lab/CC	Standards
IV.	**APPLIED AV MATH PART 2**	**CR**	**Lab/CC**	**Standards**
	In this unit, students will continue their learning of how to use math and industry standard formulas, as well as how to use correct units of measure in the AV industry. Building on the knowledge acquired in Applied Audiovideo Math Part 1, students will delve deeper into concepts such as determining loudspeaker circuit characteristics, using Ohm's Law to predict total electrical impedance of loudspeakers, and applying calculations to real-world scenarios. ...	10	5	**Academic:**

In this unit, students will continue their learning of how to use math and industry standard formulas, as well as how to use correct units of measure in the AV industry. Building on the knowledge acquired in Applied Audiovideo Math Part 1, students will delve deeper into concepts such as determining loudspeaker circuit characteristics, using Ohm's Law to predict total electrical impedance of loudspeakers, and applying calculations to real-world scenarios.

Each student will work from a pre-defined set of project requirements to calculate the amount of current required to power the audiovisual equipment within a rack. They will then determine loudspeaker circuit characteristics and ensure proper loudspeaker performance, and diagram how to wire loudspeakers in parallel. The student will also demonstrate their understanding of the order of operations, conversions between US and Metric units, and converting dimensions on scaled drawings.

Topics Covered:

- Math Refresher
- Correct Units of Measure
- Order of Operations
- Conversions between US and Metric
- Converting Dimensions on Scaled Drawings
- Aspect Ratio
- Throw Distance

What Students Will Be Able to Do After Completing the Unit:

- Understand the importance of using correct units of measure in the AV industry
- Apply math and industry standard formulas to real-world scenarios
- Determine loudspeaker circuit characteristics and ensure proper loudspeaker performance
- Use Ohm's Law to predict total electrical impedance of loudspeakers
- Diagram how to wire loudspeakers in parallel
- Understand and apply the order of operations
- Perform conversions between US and Metric units
- Convert dimensions on scaled drawings
- Calculate aspect ratio and throw distance for a projector.

Overall, this unit is designed to provide students with the essential math skills and important concepts such as Ohm's Law, correct units of measure, conversions between US and Metric, and how to calculate throw distance and aspect ratio using industry standard formulas in the audiovisual industry.

Academic:
LS: 11-12.6
RSIT: 11-12.1
A-CED: 4
A-REI: 1
G-CO: 6
G-MG: 1, 3
N-CN: 1
CTE Anchor:
Communications: 2.4, 2.5
Technology: 4.1, 4.3
Problem Solving and Critical Thinking: 5.1, 5.6, 5.7, 5.8, 5.9
Responsibility and Flexibility: 7.3
Technical Knowledge and Skills: 10.1
CTE Pathway:
A2.1, A6.2, A8.1

V.	IMPLEMENTING LIVE EVENT AV SOLUTIONS	CR	Lab/CC	Standards
	In this unit, students will learn the skills and knowledge necessary to design, plan, and implement live event audiovideo solutions. The course will cover both technical and creative aspects of live event production, including sound reinforcement, lighting design, video projection, and stage management. Students will also learn about industry standards and best practices for ensuring a successful event. Each student will work in teams to plan and execute a live event, including creating a detailed production plan, designing and setting up the audiovisual equipment, and running the show. They will be responsible for coordinating all aspects of the event, from sound and lighting to video and stage management. Topics Covered: • Sound reinforcement • Lighting design • Video projection • Stage management • Industry standards and best practices • Event planning and coordination • Technical and creative aspects of live event production What Students will be able to do after completing the unit: • Design, plan, and implement live event audiovisual solutions • Understand industry standards and best practices for live event production • Coordinate all aspects of a live event, including sound, lighting, video, and stage management • Create detailed production plans and execute them successfully In conclusion, this unit is designed to provide students with the knowledge and skills necessary to succeed in the live event audiovisual industry. By learning about sound reinforcement, lighting design, video projection, and stage management, as well as industry standards and best practices.	5	25	**Academic:** LS: 11-12.1, 11-12.2, 11-12.4 RSIT: 11-12.3, 11-12.5 WS: 11-12.4, 11-12.7 A-REI: 1 **CTE Anchor:** Communications: 2.5, 2.6, 2.7, 2.8 Technology: 4.1, 4.2, 4.5 Problem Solving and Critical Thinking: 5.2, 5.7, 5.8 Health and Safety: 6.2, 6.3, 6.4, 6.8 Responsibility and Flexibility: 7.2 Ethics and Legal Responsibilities: 8.1, 8.4, 8.7 Leadership and Teamwork: 9.4 Technical Knowledge and Skills: 10.1, 10.1, 10.6, 10.12 **CTE Pathway:** A1.1, A1.2, A2.1, A2.3, A3.1, A4.1, A5.1, A8.1, A8.2, A8.3, A8.4, A8.5
VI.	SERVICING AV SOLUTIONS	CR	Lab/CC	Standards
	In this unit, students will learn how to properly service audiovisual (AV) equipment after it has been installed. They will learn about the common issues that may arise with AV equipment and how to troubleshoot and fix them. They will also learn about the importance of regular maintenance and how to properly maintain AV equipment to ensure it lasts as long as possible. Each student will be given a scenario in which they must troubleshoot and fix an issue with AV equipment. They will be required to use the knowledge and skills they have learned in the unit to diagnose the problem, and come up with a solution. They will then present their solution to the class, explaining the steps they took to fix the issue. Topics Covered: 1. Common issues with AV equipment 2. Troubleshooting and problem-solving 3. Importance of regular maintenance 4. Maintenance procedures for AV equipment 5. Safety precautions when servicing AV equipment 6. Industry standard tools and equipment used for servicing AV equipment. What students will be able to do after completing the unit:	5	25	**Academic:** LS: 11-12.1, 11-12.2, 11-12.5 RSIT: 11-12.3 WS: 11-12.3, 11-12.4 G-GMD: 1, 3 **CTE Anchor:** Communications: 2.2, 2.3, 2.5, 2.6, 2.7, 2.8 Career Planning and Management: 3.6 Technology: 4.1, 4.2, 4.5 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.4, 5.5, 5.6,

1. Troubleshoot and fix common issues with AV equipment
2. Understand the importance of regular maintenance for AV equipment
3. Perform regular maintenance procedures on AV equipment
4. Use industry standard tools and equipment for servicing AV equipment
5. Understand and follow safety precautions when servicing AV equipment

In conclusion, this unit will provide students with the necessary knowledge and skills to properly service AV equipment after it has been installed. The students will learn how to troubleshoot and fix common issues, how to perform regular maintenance, and how to use industry standard tools and equipment.

			5.7, 5.8, 5.9 Health and Safety: 6.4, 6.7, 6.8, 6.9, 6.10, 6.11 Responsibility and Flexibility: 7.1, 7.6, 7.7 Ethics and Legal Responsibilities: 8.1, 8.2, 8.5 Technical Knowledge and Skills: 10.1, 10.1, 10.2, 10.3 Demonstration and Application: 11.4 **CTE Pathway:** A2.2, A2.3, A2.4, A7.1, A8.1, A8.2

VII.	AV NETWORKING AND SECURITY	CR	Lab/CC	Standards
	In this unit, students will learn about the various networking and security considerations that are crucial in the audiovisual industry. As AV systems become increasingly integrated with IT networks, it is important for AV professionals to understand how to properly configure, secure, and troubleshoot these systems. Topics covered in this unit include network architecture, topology, protocols, and security best practices. Each student will work in teams to design and implement a secure AV network for a simulated live event. This will include creating a network diagram, configuring network devices, and implementing security measures such as firewalls and access controls. Additionally, students will be responsible for troubleshooting any simulated issues that may arise during the event. Topics Covered: • Network architecture and topology • Network protocols and standards • Network security best practices • Firewall and access control configuration • Network troubleshooting What Students Will Be Able to Do After Completing the Unit: • Understand the basics of network architecture and topology as it relates to AV systems • Understand network protocols and standards used in AV systems • Understand best practices for securing AV networks • Be able to design and implement a secure AV network for a live event • Be able to troubleshoot network issues in an AV environment In conclusion, in the audiovisual industry it is essential to understand how to properly configure and secure AV systems that are integrated with IT networks. This unit provides a comprehensive introduction to AV networking and security, including topics such as network architecture, protocols, and security best practices.	5	25	**Academic:** LS: 11-12.1, 11-12.2 WS: 11-12.2, 11-12.5 N-CN: 1 N-VM: 8 **CTE Anchor:** Communications: 2.1, 2.3 Career Planning and Management: 3.3 Technology: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 Problem Solving and Critical Thinking: 5.1, 5.2, 5.3, 5.5, 5.6, 5.9, 5.10 Health and Safety: 6.2, 6.9 Responsibility and Flexibility: 7.6 Ethics and Legal Responsibilities: 8.1, 8.2, 8.3, 8.5, 8.7 Leadership and Teamwork: 9.2 Technical Knowledge and Skills: 10.1, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.11, 10.12, 10.14 Demonstration and

VIII.	EMPLOYMENT & CAREER PORTFOLIO	CR	Lab/CC	Standards
	This unit is designed to provide students with the knowledge and skills necessary to successfully enter the audiovisual industry. The focus will be on creating a professional portfolio, understanding the job market, and learning the skills and qualifications needed for different audiovisual positions. This unit will also cover the steps to finding and applying for jobs in the industry, as well as interviewing and networking strategies. Each student will create a professional portfolio that includes their resume, cover letter, and a selection of their best work. The portfolio should showcase their skills and qualifications in the audiovisual field, and should be tailored to the type of position they are applying for. The student will also research and analyze the job market in the audiovisual industry, identifying the most in-demand positions and the qualifications required for those jobs. Topics Covered: • Creating a professional portfolio • Resume and cover letter writing • Job market research and analysis • Interview and networking strategies • Skills and qualifications needed for different audiovisual positions The student will be able to: • Create a professional portfolio that showcases their skills and qualifications in the audiovisual field • Understand the job market in the audiovisual industry and identify in-demand positions • Write a resume and cover letter tailored to the type of audiovisual position they are applying for • Successfully find and apply for jobs in the audiovisual industry • Interview and network effectively to secure a position in the industry In conclusion, this unit will provide students with the tools and knowledge they need to enter the audiovisual industry. By creating a professional portfolio, understanding the job market, and learning the skills and qualifications needed for different positions, students will be well-prepared to find and secure a job in the industry. Additionally, the unit will teach them how to interview and network effectively, which are essential skills for success in any field.	5	5	**Academic:** LS: 11-12.6 WS: 11-12.4 **CTE Anchor:** Communications: 2.1, 2.5, 2.6, 2.7 Career Planning and Management: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9 Technology: 4.2, 4.5 Problem Solving and Critical Thinking: 5.4 Health and Safety: 6.2 Responsibility and Flexibility: 7.2, 7.3, 7.4, 7.7 Ethics and Legal Responsibilities: 8.1, 8.2, 8.4, 8.5, 8.6, 8.7 Leadership and Teamwork: 9.2, 9.4, 9.5, 9.7 Technical Knowledge and Skills: 10.1, 10.14 Demonstration and Application: 11.1, 11.3, 11.5 **CTE Pathway:** A1.1, A8.1
IX.	CERTIFICATION	CR	Lab/CC	Standards
	In this unit, students will learn about industry certifications available in the audiovisual industry, including the process of obtaining certifications, the benefits of holding certifications, and the various types of certifications available. The unit will cover the requirements for certification, the testing process, and the importance of continuing education to maintain certifications. Students will research and select an industry certification that aligns with their career goals. They will then create a plan to obtain the certification, including a schedule of study, a list of resources, and a timeline for testing. Students will also create a continuing education plan to maintain their certification. Topics Covered:	2	3	**Academic:** LS: 11-12.1 **CTE Anchor:** Demonstration and Application: 11.2, 11.4 **CTE Pathway:** A3.1, A3.3, A3.5, A6.6, A7.1

Before the table, at top right of page:

Application: 11.1
CTE Pathway:
A1.2, A2.1, A2.2, A2.3, A2.4, A3.2, A3.5, A3.6, A6.1, A6.4, A7.1, A7.3, A8.1, A8.3

- Industry certifications available in the audiovisual industry
- The process of obtaining certifications
- The benefits of holding certifications
- Various types of certifications available
- Requirements for certification
- The testing process
- Importance of continuing education to maintain certifications

After completing the unit, students will be able to:

- Understand the various industry certifications available in the audiovisual industry
- Create a plan to obtain an industry certification
- Understand the requirements for certification
- Understand the importance of continuing education to maintain certifications

Each student enrolled in the pathway will have the opportunity to take the following certification(s) during this course:

- AVIXA Recognized AV Technologist Certificate (Retest or retake depending on student passing the certification in the Essentials Class) AVIXA-Recognized AV Technologist Test has been developed to not only provide a common AV vocabulary, but also provide a bridge to the ANAB-accredited Certified Technology Specialist™ (CTS®) credentials.
- https://www.avixa.org/training-section/technologist-certificate

In conclusion, students will learn about the various industry certifications available in the audiovisual industry and the importance of obtaining and maintaining certifications in the field. They will have the opportunity to research and plan for obtaining a certification that aligns with their career goals, and learn about the requirements, testing process, and the importance of continuing education to maintain certifications.

Entered by:

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