

Digital Audio Technology I

Level: 2

Career Cluster: Media Arts

Program: Lighting and Sound Technology

Pathway: Recording Arts Technology/Technician

Course Catalog Description

Students learn the basics of digitally recording, editing, mixing, organizing, and delivering audio for music, film, broadcast, gaming, podcasting, streaming, and live sound using digital tools, workflows, and platforms.

Summary

Course that introduces students to digital-first audio production across industries such as music, broadcasting, film, gaming, podcasting, streaming, and live sound. Students develop technical knowledge of digital audio systems, signal flow, audio interfaces, microphones, and digital audio workstations while building skills in recording, editing, mixing, processing, organizing, collaborating on, and delivering audio content for multiple digital platforms. The course emphasizes critical listening, creative decision-making, and professional digital workflows, including session setup, file management, metadata, version control, cloud-based collaboration, and project organization. Students also explore career pathways, industry practices, accessibility considerations, legal and ethical use of digital media, and emerging technologies while applying safe and collaborative practices in studio and production environments.

Notes

The updated course reflects a significant shift from the original A/B course model toward a more comprehensive, industry-aligned CTE framework. While the original course primarily emphasized foundational technical skills such as audio equipment operation, recording, and basic production workflows within a Part A/Part B structure, the revised course expands to include more structured and measurable student learning outcomes, advanced digital workflows, and professional practices such as file management, collaboration, and accessibility. Additionally, the new version introduces key components not explicitly defined in the original course, including portfolio development, leadership, work-based learning, and a culminating final assessment project, strengthening alignment with current CTE expectations for career readiness, real-world application, and employability skills. Overall, the updated course demonstrates a transition from primarily technical skill acquisition to a more holistic, career-connected model emphasizing project-based learning, professional behaviors, and postsecondary readiness.

Student Learning Outcomes

1. Career Exploration and Postsecondary Opportunities

Objective: *Students will analyze career pathways in the recording arts and audio technology industry by examining job roles, workplace environments, industry terminology, certifications, professional organizations, evolving technologies, and Colorado postsecondary education options in order to make informed career and education decisions.*

- 1) Identify various career pathways and job opportunities in the recording arts technician/technology industry
 - a. Recognize the work typically performed, tools and technology used, and nature of work environments
 - b. Identify potential certifications within the careers
 - c. Find membership organizations associated with the careers
 - d. Understand the necessary education associated within the career opportunities
- 2) Understand the history, current practices, and future trends for recording arts technician/technology careers such as radio and television broadcasting, video and film, animation and game design, music production, and live sound
- 3) Describe how the changing technology is impacting the recording arts technician/technology industry
- 4) Define and appropriately use terminology associated with the recording arts technician/technology industry
- 5) Identify postsecondary opportunities within Colorado
 - a. Technical and community colleges, universities
 - b. Certificates, associates, bachelors, and advanced degrees

2. Audio Production Systems and Equipment

Objective: *Students will explain and apply foundational knowledge of digital and analog audio production equipment by identifying microphone types and pickup patterns, audio consoles, interfaces, signal processing tools, recording devices, cabling and connectors, MIDI and auxiliary hardware, and speaker systems used in studio, broadcast, streaming, and live sound environments.*

- 6) Understand types and applications of microphones such as dynamic, condenser, ribbon pressure zone (PZM), universal serial bus (USB), and wireless
- 7) Understand pick-up patterns and applications of microphones such as cardioid, omnidirectional and figure eight
- 8) Understand the operation and application of audio consoles (mixers) such as broadcast consoles, live sound consoles, and recording consoles
- 9) Understand the operation and application of audio processing equipment or software such as equalizer (EQ), dynamic compressor, noise gate, band pass filters, reverb and delays
- 10) Understand the operation and application of analog and digital audio recording devices such as handheld recorders, USB interfaces, multi-track devices, and digital audio workstations (DAW)

- 11) Understand the application of audio interconnect cabling and connectors such as XLR balanced, TRS balanced, TS unbalanced, RCA, 1/4" TRS/TS, and mini TRS/TS
- 12) Understand the operation and application of additional audio hardware such as musical instrument digital interface (MIDI) controllers, direct boxes, audio splitters, and analog to digital converters as needed
- 13) Understand the types and applications of audio speakers such as broadcast monitors, studio monitors, and live sound speakers

3. Audio Production Fundamentals and Technical Concepts

Objective: *Students will analyze the elements and technical components of audio productions by identifying stems, emotional impact, production techniques, and digital audio formats in order to make effective creative and technical audio decisions.*

- 14) Identify key elements (stems) of an audio production such as dialogue, sound effects, music, and environmental
- 15) Understand how music styles, sound effects, or vocal performances can create a specific emotional impact
- 16) Identify key technical elements of audio production for effect such as panning, ducking, track doubling, retiming, and auto-tune
- 17) Understand and identify digital audio codecs and compression standards such as Waveform Audio (WAV), MP3, and advanced audio coding (AAC)

4. Content Development, Audio Assets and Legal Use

Objective: *Students will develop and manage digital audio production assets by applying writing skills to scripts and show plans, creating or sourcing audio materials through recording, synthesis, or licensed use, and organizing digital files and documentation to meet project, legal, and distribution requirements.*

- 18) Identify key elements required in audio scripts
- 19) Apply writing skills to develop an audio script
- 20) Create or obtain required digital audio assets through recording, synthesis, sampling, or licensed use, and document source, permissions, and usage requirements as needed.
- 21) Apply metadata and labeling practices to digital audio assets and exports, including file names, track names, version identifiers, and basic descriptive information to support organization, collaboration, and delivery.
- 22) Use shared digital workflows to collaborate on audio projects by following agreed naming conventions, folder structures, feedback protocols, backup procedures, and version-control practices.
- 23) Identify accessibility considerations in digital audio distribution, such as clear speech, intelligibility, transcripts, captions support, and platform-appropriate formats when audio is paired with multimedia content.

5. DAW Workflow, Editing, Mixing and Delivery

Objective: *Students will use digital audio workstations (DAWs) to record, edit, process, and prepare audio content by working with audio and MIDI tracks, editing tools,*

software plug-ins, automation, and delivery formats suitable for multiple distribution platforms.

- 24) Understand how to record or import various types of audio content such as audio files, MIDI data or automation
- 25) Understand types and applications of audio track such as instrument track, master track, auxiliary track, and global attributes track
- 26) Understand audio editing tools and transitions such as cut, trim, and fade
- 27) Understand the use and application of software plug-ins such as EQ, dynamic compression, reverb, and software instruments
- 28) Understand the use and application of software automation
- 29) Understand the various delivery formats such as disk, broadcast, cellular, portable device, electronic, and online delivery
- 30) Apply session organization and file-management practices such as naming conventions, folder structures, backups, and version control to maintain professional digital projects.
- 31) Demonstrate gain staging and metering by setting recording and mix levels to prevent clipping and reduce noise while achieving appropriate headroom.
- 32) Use routing and bussing concepts (aux sends/returns, submixes, groups, and master bus processing) to manage complex sessions efficiently.
- 33) Export and deliver audio using appropriate technical specifications (sample rate, bit depth, codec, loudness targets, file naming, and file formats) for the intended platform (broadcast, streaming, video, podcast, or live playback).

6. Studio Workflow, Signal Flow and Safety

Objective: *Students will apply professional studio workflow and safe operating practices by documenting signal flow, using proper gain structure and hearing protection, and following procedures for handling, powering, and storing audio equipment in order to maintain a safe and efficient production environment.*

- 34) Diagram and explain end-to-end signal flow for common studio and live configurations (source → preamp → processing → interface/console → recorder/DAW → monitoring).
- 35) Follow safe setup and shutdown procedures (phantom power use, cable management, proper lifting, and equipment storage) to prevent damage and reduce hazards.
- 36) Apply hearing-safety practices by setting safe monitoring levels, using hearing protection when appropriate, and describing the risks of prolonged high-SPL exposure.
- 37) Troubleshoot common audio issues (no signal, distortion, noise/hum, phase problems, incorrect routing, or digital sync/configuration issues) using a systematic process and proper terminology.

7. Critical Listening and Mix Evaluation

Objective: *Students will develop critical-listening and mix-evaluation skills by identifying and describing frequency balance, dynamics, stereo imaging, time-based effects, noise, and overall clarity using appropriate audio terminology in order to evaluate mixes, justify production choices, and revise work to meet project goals.*

- 38) Use appropriate audio terminology to describe and critique recordings and mixes (tone, timbre, balance, clarity, depth, punch, space, distortion, noise, phase, and stereo image).
- 39) Identify common frequency ranges and audible issues (rumble, mud, harshness, sibilance, brittleness) and propose EQ strategies to improve mix intelligibility and tonal balance.
- 40) Evaluate dynamics processing by listening for compression artifacts and changes in transient impact, sustain, and loudness, and recommend adjustments using threshold, ratio, attack, release, and makeup gain.
- 41) Assess stereo imaging and phase relationships by identifying width, panning, mono compatibility, and phase cancellation, then recommend panning, polarity, timing, or mic-placement solutions.
- 42) Use reference tracks and project requirements to set mix targets (balance, genre-appropriate tone, loudness, and space) and compare works-in-progress to professional examples.
- 43) Revise a mix based on self-assessment and peer/instructor feedback by documenting changes in digital production notes (what/why) and demonstrating measurable improvement across at least two mix criteria.

8. Portfolio Development

Objective: *Students will develop and curate a digital audio portfolio by organizing completed projects, demonstrating technical and creative growth, and reflecting on work for academic and career readiness.*

- 44) Collect and organize completed audio projects using appropriate file formats, naming conventions, and metadata.
- 45) Demonstrate growth by selecting portfolio pieces that showcase technical skills and creative decisions.
- 46) Reflect on portfolio work to explain production choices, strengths, and areas for improvement.

9. Leadership

Objective: *Students will demonstrate leadership in audio production environments by communicating effectively, collaborating with peers, and contributing to inclusive and productive team workflows.*

- 47) Demonstrate leadership behaviors such as responsibility, communication, and collaboration during audio projects.
- 48) Contribute to team-based production by supporting roles, timelines, and shared goals.
- 49) Participate in critique and feedback processes to improve team outcomes.

10. Work-Based Learning

Objective: *Students will apply technical and professional skills through work-based learning experiences connecting classroom audio production to real-world applications.*

- 50) Participate in work-based learning experiences such as client projects, job shadows, or guest critiques.
- 51) Demonstrate professional skills including communication, time management, and reliability.
- 52) Reflect on experiences to evaluate career interests and skill development.

11. Final Assessment Project

Objective: *Students will complete a culminating audio production project demonstrating technical skills, creative decision-making, and professional workflow.*

- 53) Plan and produce a final audio project integrating recording, editing, mixing, and delivery concepts.
- 54) Present the completed project and explain technical processes and creative choices using appropriate terminology.

12. Career and Technical Student Organizations

Objective: *Using the CTSO Resource Document, chapter activities will provide some of the best opportunities CTSO members will have to learn by doing. A successful program of work creates a positive learning atmosphere in the classroom. CTSO members learn how to accept responsibility, work as a team, manage a budget, and handle success and failure. Per the CTE Admin Handbook, CTSOs are embedded into curriculum.*

Professional Development

Prepare each member for entry into the workforce and provide a foundation for success in a career. Becoming a professional does not stop with acquiring a skill, but involves an increased awareness of the meaning of good citizenship and the importance of labor and management in the world of work.

Community Service

Promote and improve goodwill and understanding among all segments of the community through services donated by CTSO chapters, and to instill in its members a lifetime commitment to community service.

Business & Industry Connections

Increase awareness of quality job practices and attitudes, and increase the opportunities for employer engagement and eventual employment.

Financial Leadership

Plan and participate in activities to allow all members to carry out the chapter's projects. Educate members on their own personal finance for current and future success.

Public Relations

Make the general public aware of the good work that students in career and technical education are doing to better themselves and their community, state, nation, and world.

Social Activities

To increase cooperation in the school and community through activities that allow CTSO members to get to know each other in something other than a business or classroom setting.

Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

[CO CTE Academic Standards Resources](#) (Rubrics, integration strategies, etc)

[CDE Colorado Academic Standards Online](#) (Online standards lookup tool)

Note: Mathematics and Science standards will be added in the future. Visit the [Colorado Academic Standards](#) page for the most current version.

Reading, Writing and Communicating Crosswalk

Course: Digital Audio Technology I

Colorado Academic Standards – Reading, Writing, and Communicating

Standard	Prepared Graduate Competency	Description	Course Evidence / Alignment
Standard 1: Oral Expression and Listening	Prepared Graduate 1 – Collaboration	Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective.	Students work collaboratively in audio production environments, participate in critiques, follow verbal direction, and contribute ideas during team-based recording and mixing projects.
Standard 1: Oral Expression and Listening	Prepared Graduate 2 – Oral Presentations	Deliver effective oral presentations for varied audiences and varied purposes.	Students explain audio concepts, production choices, and project outcomes to peers and instructors.
Standard 2: Reading for All Purposes	Prepared Graduate 4 – Informational Texts	Read a wide range of informational texts to build knowledge and to better understand the human experience.	Students read and interpret technical documentation, equipment manuals, software tutorials, industry standards, and safety guidelines.
Standard 2:	Prepared	Understand how language	Students use and

Reading for All Purposes	Graduate 5 – Language in Context	functions in different contexts, command a variety of word-learning strategies to assist comprehension, and make effective choices for meaning or style when writing and speaking	adapt industry-specific vocabulary accurately in written and spoken audio production contexts.
Standard 3: Writing and Composition	Prepared Graduate 7 – Informational Writing	Craft informational/explanatory texts using techniques specific to the genre.	Students write production notes, signal flow documentation, project plans, and reflective explanations of audio work.
Standard 3: Writing and Composition	Prepared Graduate 9 – Writing Process	Demonstrate mastery of their own writing process with clear, coherent, and error-free polished products.	Students revise written documentation and prepare clear, coherent, and polished project-related written materials.
Standard 4: Research Inquiry and Design	Prepared Graduate 10 – Research & Ethics	Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions.	Students research audio techniques and technologies, evaluate sources, and apply ethical and legal practices including copyright and intellectual property.

Free Resource Links

1. Career Explorations and Postsecondary Opportunities

- My Next Move (audio careers, job outlooks, education pathways)
<https://www.mynextmove.org/>
- CareerOneStop – Audio and Sound Careers (certifications, training, career exploration)
<https://www.careeronestop.org/>
- Bureau of Labor Statistics – Audio and Video Technicians (job duties, work environments, wages)
<https://www.bls.gov/ooh/media-and-communication/audio-and-video-technicians.htm>
- Audio Engineering Society (professional organizations, industry standards, careers)
<https://www.aes.org/>

2. Audio Production Systems and Equipment

- Shure Audio Institute (microphones, pickup patterns, signal basics)
<https://www.shure.com/en-US/shure-audio-institute>
- Sweetwater InSync (mixers, microphones, interfaces, audio hardware explanations)
<https://www.sweetwater.com/insync/>
- Yamaha Pro Audio Learning (audio consoles, studio and live sound systems)
<https://training.yamaha.com/>
- Audio University (microphones, cabling, audio equipment fundamentals)
<https://audiouniversityonline.com/>

3. Audio Production Fundamentals and Technical Concepts

- BBC Bitesize – Sound (audio basics, pitch, volume, effects)
<https://www.bbc.co.uk/bitesize/topics/zvsfr82>
- Khan Academy – Sound and Waves (frequency, amplitude, wave behavior)
<https://www.khanacademy.org/science/physics/mechanical-waves-and-sound>
- Explain That Stuff – Sound (how sound works, hearing, audio concepts)
<https://www.explainthatstuff.com/sound.html>
- iZotope Learn (audio theory, emotion, production techniques)
<https://www.izotope.com/en/learn.html>

4. Content Development, Audio Assets and Legal Use

- Creative Commons (copyright, attribution, licensed audio)
<https://creativecommons.org/>
- FreeSound (sound effects, licensed audio assets)
<https://freesound.org/>
- U.S. Copyright Office – Education Resources (copyright law, fair use)
<https://www.copyright.gov/education/>

- BBC Sound Effects Library (licensed sound effects for education)
<https://sound-effects.bbcrewind.co.uk/>

5. DAW Workflow, Editing, Mixing and Delivery

- Audacity Tutorials (audio recording, editing, exporting)
<https://manual.audacityteam.org/>
- Ableton Learning Music (DAW basics, MIDI, audio tracks, editing)
<https://learningmusic.ableton.com/>
- REAPER User Guide (DAW workflow, routing, exporting audio)
<https://www.reaper.fm/documentation.php>
- MusicTech Tutorials (mixing, plugins, digital workflows)
<https://musictech.com/tutorials/>

6. Studio Workflow, Signal Flow and Safety

- Shure – Audio Signal Flow Basics (signal paths, gain structure)
<https://www.shure.com/en-US/support/find-an-answer/what-is-audio-signal-flow>
- Sweetwater – Gain Staging and Signal Flow (safe levels, noise reduction)
<https://www.sweetwater.com/insync/gain-staging/>
- CDC – Hearing Protection (noise exposure, hearing safety)
<https://www.cdc.gov/niosh/topics/noise/>
- Audio University – Audio Troubleshooting (common audio problems and solutions)
<https://audiouniversityonline.com/audio-troubleshooting-guide/>

7. Critical Listening and Mix Evaluation

- SoundGym (critical listening, frequency recognition, mix skills)
<https://www.soundgym.co/>
- iZotope Ear Training (EQ, dynamics, critical listening practice)
<https://www.izotope.com/en/learn/ear-training.html>
- Sound on Sound – Mixing Techniques (mix evaluation, balance, clarity)
<https://www.soundonsound.com/techniques>
- Produce Like A Pro (mix evaluation, reference listening, revisions)
<https://producelikeapro.com/>

8. Portfolio Development

- SoundCloud (audio portfolio publishing, sharing work)
<https://soundcloud.com/>
- Behance (creative portfolios, showcasing projects)
<https://www.behance.net/>
- Adobe Portfolio (portfolio creation, project presentation)
<https://portfolio.adobe.com/>
- Berklee Online Blog (portfolio development, career readiness)
<https://online.berklee.edu/takenote/>

9. Leadership

- MindTools – Leadership Skills (team leadership, communication, decision-making)
https://www.mindtools.com/pages/main/newMN_LDR.htm
- SkillsYouNeed – Leadership and Teamwork (collaboration, interpersonal skills, feedback)
<https://www.skillsyouneed.com/leadership/>
- Edutopia – Student Leadership Resources (project leadership, collaboration strategies, classroom application)
<https://www.edutopia.org/topic/student-leadership>
- LinkedIn Learning Blog – Leadership Skills (professional communication, workplace leadership, teamwork)
<https://www.linkedin.com/business/learning/blog>

10. Work-Based Learning

- CareerOneStop – Work-Based Learning (internships, job shadows, workplace readiness)
<https://www.careeronestop.org/>
- Advance CTE – Work-Based Learning Toolkit (career-connected learning, industry partnerships, WBL strategies)
<https://careertech.org/work-based-learning>
- NACE – Career Readiness Competencies (professional skills, employability, workplace expectations)
<https://www.nacweb.org/career-readiness/competencies/>
- PBS LearningMedia – Workplace Skills (communication, teamwork, real-world applications)
<https://www.pbslearningmedia.org/>

11. Final Assessment Project

- Adobe Creative Cloud Tutorials (project planning, multimedia production, presentation skills)
<https://helpx.adobe.com/creative-cloud/tutorials-explore.html>
- Canva Design School (project presentation, storytelling, visual communication)
<https://www.canva.com/learn/>
- Google Applied Digital Skills (project planning, presentation, professional communication)
<https://applieddigitalskills.withgoogle.com/>
- TED-Ed Student Talks (presentation skills, explaining ideas, storytelling)
https://ed.ted.com/student_talks



Technology Student Association – National Competitive Events

Audio Podcasting

Objective: Students will research, script, record, edit, publish, and present an original audio podcast that meets TSA Audio Podcasting requirements for content, storytelling, technical production, copyright compliance, and presentation.

- Research the annual TSA Audio Podcasting theme and develop a focused podcast concept for a specific audience.
- Write a podcast script, outline, or episode plan that organizes narration, interviews, transitions, and supporting audio.
- Record original audio using appropriate microphones, recording devices, pickup patterns, levels, and sound-gathering techniques.
- Create or obtain audio assets such as narration, dialogue, interviews, music, sound effects, and environmental sound while following copyright and permission requirements.
- Edit and mix the podcast using techniques such as trimming, fades, volume balancing, EQ, compression, noise reduction, panning, and transitions.
- Export and submit the finished podcast in the required digital format according to TSA event procedures.
- Present the podcast to judges and explain the story concept, production process, audio choices, technical decisions, and theme connection.

Resources

- Technology Student Association – Audio Podcasting competition guidelines
<https://tsaweb.org/competitions-programs/tsa/themes-problems>
- Audacity – Free audio recording and editing software
<https://www.audacityteam.org/>
- NPR Training – Audio journalism and podcast storytelling resources
<https://training.npr.org/>
- Spotify for Podcasters – Podcast creation and publishing tools
<https://podcasters.spotify.com/>



Technology Student Association – National Competitive Events

Music Production

Objective: *Students will compose, record, edit, mix, document, and present an original music production that meets TSA Music Production requirements for creativity, technical quality, copyright compliance, and presentation.*

- Research the annual TSA Music Production theme and develop an original musical concept that responds to the challenge.
- Plan the production by identifying the intended mood, structure, instrumentation, genre, audience, and technical requirements.
- Create or record original musical elements using digital audio workstations, MIDI, software instruments, microphones, or live audio sources.
- Arrange tracks such as instruments, vocals, loops, effects, auxiliary tracks, and master tracks into a complete musical production.
- Edit and mix the production using techniques such as trimming, fading, balancing, panning, EQ, compression, reverb, delay, automation, and mastering preparation.
- Document the production process, including software/hardware used, original assets, permissions, editing decisions, and revisions.
- Present the final music production to judges and explain the creative intent, technical process, audio choices, and response to the annual theme.

Resources

- Technology Student Association – Music Production competition guidelines
<https://tsaweb.org/competitions-programs/tsa/themes-problems>
- BandLab for Education – Browser-based music production tools
<https://edu.bandlab.com/>
- Soundtrap for Education – Online music and audio production
<https://www.soundtrap.com/edu/>
- Audacity – Free audio recording and editing software
<https://www.audacityteam.org/>