La Cañada High School
Proposed Course Outline - Music Technology and Recording Arts

I.   **Course Title** – Music Technology and Recording Arts

II.   **Grade Level(s) –** 9th, 10th, 11th, 12th

III.   **Length/Credit** – Full Year/ 10 Credits for Elective Credits

IV.   **Preparations** – None

V.   **Course Description**

This course covers the study of acoustic science, digital multi-track recording and related techniques using ProTools software, Garage Band, MIDI technology, digital sound processing and editing, and other related music production techniques. The course focuses on the aesthetic qualities of sound production in the studio and live environment. It will analyze the impact of digital and analog audio technology as a vital part of communication in the world today.

The purpose of this course is to allow students, whether musicians or not, an opportunity to learn about basic functions of sound and how it is created, captured, edited, produced and delivered in the modern age. It teaches students how to creatively construct or record music using computer software and related hardware in a hands-on, project based environment. Students can expect to have a better knowledge and understanding of how music is affected by modern technologies and will be enabled and inspired to become tomorrow's music recording and production engineers – either in the professional world in a home-based studio, or merely for personal enjoyment.

Knowledge and utilization of microphones, digital, analog and computer-based audio editing and recording equipment, and software programs such as Pro Tools will be a secondary focal point to that of meeting the elements of art and principles of design as well as the components in the state standards. Study and training in the Audio Production course will prepare students for careers in music engineering and production post-production for film and television, and live sound-mixing for theater and concerts.

❏ Students will learn the terminology and vocabulary of audio production and design necessary to analyze and respond to the sensory, formal, and expressive properties of sound.
❏ Students will acquire the technical skills (an understanding of analog and digital recording, mixing and mastering, overdubbing, effects, microphone technique, radio broadcasting, podcasting and MIDI to communicate their ideas in this medium.
❏ Students will learn to make aesthetic judgments and evaluations of their own audio art, and other's work, as distinct from personal preference or "taste."
❏ Students will establish connections and meanings between the critical thinking skills that are learned in this class to other subject areas, including art forms and potential future careers.

❏ Students will demonstrate their ability to critique, compare and contrast, and evaluate audio productions in content.
❏ Students will acquire the knowledge and capability to express creative ideas and concepts with audio in other academic forums.
❏ Students will investigate recording techniques and research the productions.
❏ Students will write and record their own music, relying on the combination of intuition and modern creation techniques using software and other technologies.
❏ Students will differentiate genre and the role of the musician, music producer, and audio engineer in the mixed media industry.

VI.   Standards/ESLRs Addressed

From the CTE Standards

C1.0 Students understand important elements of technical and technology-related production management:

C2.0   Students demonstrate important skills and an understanding of the complexities of production planning:

Those two are the big overreaching standards with the subsets all working to these goals.

From the VAPA State Standards:
(https://www.cde.ca.gov/be/st/ss/muproficient.asp)

4.0 AESTHETIC VALUING

Responding to, Analyzing, and Making Judgments About Works of Music Students critically assess and derive meaning from works of music and the performance of musicians according to the elements of music, aesthetic qualities, and human responses.

Analyze and Critically Assess

4.1 Develop specific criteria for making informed critical evaluations of the quality and effectiveness of performances, compositions, arrangements, and improvisations and apply those criteria in personal participation in music.

4.2 Evaluate a performance, composition, arrangement, or improvisation by comparing each with an exemplary model.

Derive Meaning

4.3 Explain how people in a particular culture use and respond to specific musical works from that culture.

4.4 Describe the means used to create images or evoke feelings and emotions in musical works from various cultures.

5.0 CONNECTIONS, RELATIONSHIPS, APPLICATIONS

Connecting and Applying What Is Learned in Music to Learning in Other Art Forms and Subject Areas and to Careers

Students apply what they learn in music across subject areas. They develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They also learn about careers in and related to music.

Connections and Applications
5.1 Explain how elements, artistic processes, and organizational principles are used in similar and distinctive ways in the various arts.

5.2 Analyze the role and function of music in radio, television, and advertising.
Careers and Career-Related Skills

5.3 Research musical careers in radio, television, and advertising.

VII.   Brief Course Outline

Unit 1: Intro to Music Technology

This area covers the definition of the topic of music technology and it's effect on the production and delivery of media. It points out the digitization of music and how computers and related technology are the means of which most modern music is created and delivered to consumers today. A contrast is made between older technologies (phonograph, tape, compact disc, etc.) versus newer technologies (cell phones/mp3 players, iPad, subscription-based streaming audio, music production software, etc.).

In addition, this unit covers the science of sound (acoustics) – frequency, amplitude and wave shape – and then relates them to the digital realm. More specifically, this unit covers how these attributes are captured (analog-to-digital conversion) using computer software such as ProTools along with audio interfaces and how bit depth and sample rate affect frequency and amplitude. Also, how software synthesizers or plug-ins can create and/or manipulate wave shape is explored.

Unit 2: Creating, Editing and Mixing tracks

This unit focuses on teaching students the basic functions of the ProTools software. Basics such as viewing different windows (edit/mix windows), starting and stopping playback, navigating (zooming, scrolling), importing audio and working with loops, moving audio clips, editing existing tracks, setting tempo and creating a click track, recording (direct input) an instrument, and adding reverb or equalization plug-ins to tracks are covered in detail.

Audio signal flow is also discussed, which is exercised through various recording project(s). Students are also taught how to generate an mp3 version of their finished projects.

Unit 3: MIDI Recording

This area focuses on music creation using MIDI technology. Along with discussing the various applications of MIDI technology in digital media, students get the opportunity to use piano keyboard controllers and learn to input notes and are instructed on how to edit MIDI notation. A contrast is made between recording/editing audio waveforms versus MIDI. Various virtual instrument plug-ins (i.e. software synthesizers and drum machine) are used to create music within ProTools and projects are used to reinforce these concepts. Other concepts covered include quantization and basic music theory in regards to tempo, beats and song form.

Unit 4: Microphones

In this unit students are introduced to microphones and how they are used to convert sound into electrical impulses. Students are informed of the presence of a microphone's diaphragm and how it is a transducer.

Students are also lectured in detail on the various types of microphones and their perspective applications in recording. Types covered include: dynamic, condenser, ribbon, PZM/PCC, shotgun, and parabolic. Various polar patterns – cardiod, bi-directional, omni-directional - are also discussed. Also, students are taught about XLR cables and the concept of audio signal flow is reviewed and expanded.

Issues regarding microphone usage such as a feedback loop, proximity effect and popping caused by plosives are addressed. Microphone placement during the recording process is discussed including how to mic various instruments, how distance and room size/type affect the sound as well as some stereo miking techniques such as XY pair, ORTF, and spaced omnis.

Unit 5: Other Production Techniques

Within the context of class recording project(s), students learn more advanced techniques related to mixing and editing using ProTools software and plug-ins. Using an audio compressor and understanding its function, using proper panning and EQ to help create space in the mix, using a gate, de-esser, delay, distortion and other effects are all discussed in detail and applied as applicable to the project(s). Pre Production is covered by explaining how the detailed planning of a recording project is essential to the quality and timeliness of project completion.

VIII.   Methods of Assessment

The method of instruction is general note taking blended with curriculum-based projects and one-on-one instruction as students work with the software. All portions of the Course Outline are supported within these instructional methods and strategies.

Students share nearly all of their completed projects aloud to the entire class and subsequently listen to and critique their peers' projects. When learning how to edit and mix, professionally recorded music is played and analyzed and applied to current projects. Lastly, during the final recording project the original audio track is used as a "scratch track" and is constantly referenced in an attempt to match the editing/mixing quality of the original work.

Vocabulary Quiz #1 and #2 – These assessments help to reinforce the terminology used in acoustic science and digital music creation and relate directly to Unit 1 of the Course Outline. Knowing key vocabulary terms allows students to communicate effectively and concisely with the teacher and their peers in regarding various aspects of music technology and recording.

Microphone Quiz – This assessment verifies students' knowledge of microphone types and their proper usage. It directly relates to Unit 4 and 5 of the Course Outline. Understanding this topic is essential in creating a high-quality recording and also helps in preventing damage to sensitive and expensive equipment.

All other assessments are conducted at the end of each key assignment (project). Students (and teacher) listen to finished projects as a group and assess their quality and viability. This helps to keep students motivated to pursue excellence in their completion of projects.

During much of the introductory portions of the class, especially during Unit I, there are references to the historical aspects of music and how it is being affected by current technologies. Concepts relating the creation and delivery of music in the modern age versus the time prior to the advancement of computers and digital music are discussed and its implications are analyzed.

Students get the opportunity to work with other areas in the fine arts department at our school as they multitrack record audio for a live performance ensemble such as band, orchestra, or vocal groups. This occurs during the Performing Arts Project. Often times the best way for a performing ensemble to grow is by recording the group and listening back for the purpose of correcting the more subtle mistakes or flaws. Students learn how to connect and build relationships with other students and other VPA classes by producing/recording music to compliment and enhance their peers' learning experience. In addition, Music Technology students get the opportunity to work with our school's Broadcast Journalism class by creating a "newscast theme" for the school's weekly news program.

This course provides many opportunities for artistic perception. Lectures on acoustic science and digital audio provide musical examples of topics such as frequency, amplitude, wave shape, and overtones. Pictures are used to help students understand the concept of bit depth. Processing, analyzing, and responding to sensory information is nearly constant in this course due to the fact that students are frequently creating, editing and mixing music through the use of the ProTools software. Students also share their completed projects, thereby listening and critiquing their peers' projects. When learning how to edit and mix, pre-existing music is played and analyzed and applied to current projects.

This course is vastly project-based and gives opportunity for artistic expression through music, even to students who have no musical experience or who do not play an instrument. Many of the projects are created directly by the students themselves and contain original material, and the remainder allow for the manipulation of pre-existing material. Performance and participation is replaced by "playback," wherein students share their completed projects in front of the class.

Editing Project – Objective: Take an existing song edit it by removing portions within it in order to reduce its length to 2 minutes. A correlation is made to how often songs are edited in this fashion to accompany video (i.e. commercials, films, etc.) and thus altering the original delivery

purpose of the media. This project incorporates the topics of sample rate, frequency and amplitude, and creating, editing and mixing tracks within ProTools.

Loops Project – Objective: Create an original composition by organizing various loops. This project incorporates the topics of sample rate, frequency and amplitude, and creating, editing and mixing tracks, and generating an mp3 file (bounce to disk) within ProTools.

Direct Input Project – Objective: Using a digital interface, record an instrument (something that can be directly plugged in such as guitar or keyboard) and create an instrumental version of an existing song or original song. Overdubbing tracks must be utilized. Adding loops is optional. Edit and mix the recording. This project incorporates the topics of signal flow, gain setting, tempo, using reverb plug-ins, sample rate, frequency and amplitude, and creating, editing and mixing tracks, and generating an mp3 file within ProTools.

Mixing Project – Objective: Import pre-recorded audio files, edit and mix the tracks by adding necessary EQ, reverb, adjusting panning and volume levels. This project incorporates the topics of Equalization, reverb, creating auxiliary sends and master fader (Signal flow), sample rate, frequency and amplitude, and creating, editing and mixing.

Ringtone Project – Objective: Using a software synthesizer, create three ringtones or notification tones that you would find on a cell phone. Input notes using MIDI keyboards. This project incorporates the topics of recording and editing MIDI information and the use of ProTools instrument plug-ins to create original media.

Drum Machine Project – Objective #1: Use Boom (software drum machine) to create at least 3 original drum patterns and sequence/record them onto a track. Objective #2: Add additional music tracks (original) by using other virtual instruments and overdubbing the drum track. Edit and mix all of the tracks. This project incorporates the topics of recording and editing MIDI information and the use of ProTools virtual instrument plug-ins to create original media as well as basic music theory in regards to beats, tempo and song form.

News Theme Project – Objective: Create a "Newscast Theme" song. May be done in groups or individually. This project integrates with our school's Broadcast Journalism class. The students of Music Technology submit their finished projects and the Broadcast Journalism class votes on which theme they want to use for their weekly newscast show (which is played for the entire student body). This project incorporates all aspects of the course topics learned up to this point, with an emphasis on using virtual instruments and recording MIDI.

Radio Ad Project – Objective: Create a 30 second radio advertisement. Choose a product or event (real or imaginary) that you would advertise on radio. Record a voiceover and accompany it with music and/or sound effects as necessary. This project incorporates the topics of microphones, signal flow, and editing and mixing audio.

Performing Arts Project – Objective: Produce a high-quality recording of our school's band or orchestra or other performing group. Mix and edit the tracks. Allows students the opportunity to work with other areas in the fine arts department and learn to multitrack record audio for a live ensemble. This project incorporates the topics of microphones, stereo miking techniques, signal flow, and editing and mixing audio.

Final Project – Objective: Produce a high-quality audio recording. First, a pre-existing song is chosen by the class. Then, students record the song by tracking every instrument over the course of many weeks in an attempt to re-create the track as close to the original as possible. Once the raw tracks are recorded, students must mix and edit the recording. This project incorporates understanding and applying preproduction, using a compressor, advanced editing and mixing techniques along with all previous topics covered.

Evaluation:

Grades:

All work will be assigned a point value, although not all work will receive a letter grade. Grades are based on total points accumulated during each grading period. The class is structured in such a way to approximate a student's grade breaking down into the following percentages:

Examinations:	**20%**	**A= 90-100 %**
Homework/Classwork:	**30%**	**B = 79-89.9 %**
Projects:	**50%**	**C = 67- 78.9 %**
		D = 55-66.9 %
		F = Below 54.9 %

IX. **Materials/Textbook(s)**
   All instructional materials have been created by the class instructor. They are compilation of notes and diagrams that have been created specifically for the needs of this class.

X. **Seeking "a-f" Approval** – Yes/No – Yes, this course will be submitted to the University of California for approval for the 2019-20 academic year in the subject domain "f" for Electives

XI. **Seeking AP Class Approval** – Yes/No – This course does NOT seek AP approval.