

## MISSION TRAILS REGIONAL OCCUPATIONAL PROGRAM

1. **Course Title** Music Technology
2. **CBEDS Title** Computers and Electronic/Digital Music
3. **CBEDS Number** 2323
4. **Job Titles/DOT Codes**

Audio Engineer	194.262-010
Sound Controller	194.262-014
Sound Mixer	194.262-018
Studio Engineer	194.262-018
Studio Technician	194.262-018
Arranger	152.067-010
Composer	152.067-014
Music Engraver	972.681-010
Musician instrumental	152.041-010
Singer	152.047-022
Musical Director	152.047-018
Music Director	100.367-022
Music Instructor	152.021-010
5. **Course Description**

This course is involved with the role of technology in musical applications. The course will include live sound production, recording techniques, computer-assisted composition, and music notation. A variety of software and hardware will be utilized. Prior experience in music is desirable, particularly in reading music notation.
6. **Hours** 360
7. **Prerequisites** Recommended 10<sup>th</sup> grade reading level
8. **Date of Revision** Board Approved Date: \_\_12/10/2008, Advisory  
Prepared By: David Hoffman  
Date: December 10, 2008

**9. Course Outline**

a. CONTENT AREA SKILLS:

- i. Expected student outcomes
- ii. Hours of instruction

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS		
Instruction will include:	Student will be able to:	CR	CC	CVE
I. Technology – Integrated throughout course	A. Select, setup, operate and maintain a variety of technologies, including computers, MIDI keyboards, audio interfaces, and microphones. B. Use computers to process information and apply audio presentation of ideas. C. Research, compile and complete written documents assigned.	Integrated in content area skills		
II. Business Functions –	A. Identify, plan and manage time, materials, facilities and human resources. B. Analyze costs associated with music productions.	6	6	
III. Introduction to Audio Theory –	A. Understand the acoustics and psychoacoustics of sound. B. Understand the different types of digital signal processing. C. Understand the concepts of sample rate and resolution.	10	10	
IV. Loop-based Compositions –	A. Demonstrate the use of Garage Band to create a musical composition consisting primarily of prerecorded loops. B. Identify formal structures in popular songs. C. Use Garage Band to create a soundtrack for a selected poem.	25	25	
V. Introduction to Music Theory and Aural Skills –	A. Demonstrate the ability to identify musical intervals when presented aurally and visually. B. Demonstrate the ability to play major scales and simple melodies in a variety of keys utilizing a MIDI keyboard. C. Demonstrate the ability to accurately perform simple rhythms. D. Identify chord types when presented aurally.	10	10	

<p>VI. Music Notation –</p>	<p>A. Use Sibelius to engrave a simple musical score.  B. Use Sibelius to playback a musical score using sound samples.  C. Export a Sibelius notation file into a MIDI file.</p>	<p>10</p>	<p>10</p>	
<p>VII. Musical Composition using Virtual Instruments and Effects</p>	<p>A. Learn the various components of Reason.  B. Demonstrate the ability to use a software sequencer to create a musical composition.  C. Create an original work using a variety of software instruments and effects contained within Reason.</p>	<p>20</p>	<p>20</p>	
<p>VIII. Microphones –</p>	<p>A. Identify requirements for sound reproduction.  B. Identify appropriate microphones for live sound applications.  C. Identify appropriate microphones for studio applications.  D. Understand the technologies behind dynamic, condenser, and ribbon microphones.  E. Understand the uses of various polar patterns.  F. Demonstrate an understanding of location acoustics and microphone placement.</p>	<p>10</p>	<p>10</p>	
<p>IX. Musical Instrument Digital Interface –</p>	<p>A. Explain uses of MIDI.  B. Show methods for connecting MIDI devices.  C. Distinguish between tempos, bars, and time signatures.  D. Employ synchronization techniques.  E. Employ the use of multiple MIDI channels.  F. Understand what information is sent via MIDI messages</p>	<p>10</p>	<p>10</p>	

X. Audio Mixing Boards –	<p>A. Understanding Inputs and Outputs.</p> <p>B. Demonstrate an understanding of the channel strip.</p> <p>C. Demonstrate the ability to use inserts and buses to add signal processors.</p> <p>D. Optimize signal flow and levels.</p> <p>E. Understand microphone vs. line level signals.</p> <p>F. Create sample setups for live applications including amplification and monitoring.</p> <p>G. Learn to operate a mixing board in a live sound setting.</p>	<b>35</b>	35	
XI. Connectors and Cables –	<p>A. Identify and utilize appropriate analog and digital cables.</p> <p>B. Know the difference between connector types and protocols.</p> <p>C. Know the difference and appropriate uses for balanced and unbalanced cables.</p>	<b>2</b>	<b>2</b>	
XII. Data Management –	<p>A. Manage file locations including the use of external drives.</p> <p>B. Understand various audio file formats (.mp3, .aif, .aac, .wav, .mid).</p> <p>C. Moving files between applications with and without utilities.</p>	<b>2</b>	<b>2</b>	
XII. Recording –	<p>A. Compare analog and digital audio.</p> <p>B. Understand optimizing the front end for exceptional tracking.</p> <p>C. Capture audio at appropriate levels.</p> <p>D. Utilize Pro Tools to combine and edit audio files.</p> <p>E. Utilize Pro Tools to mix a multitrack recording.</p> <p>F. Utilize plug-ins to master a multitrack recording.</p> <p>G. Know a variety of strategies for bouncing audio to disk.</p>	<b>40</b>	<b>40</b>	
	<b>TOTAL</b>	<b>180</b>	<b>180</b>	

**9. Course Outline**

**b. CAREER PERFORMANCE STANDARDS**

- i. Expected student outcomes
- ii. Hours of instruction

<b>CAREER PERFORMANCE STANDARDS</b>	<b>EXPECTED STUDENT OUTCOMES</b>	<b>HOURS</b>
<b>Instruction will include:</b>	<b>Student will be able to:</b>	
<p><b>1. Personal Skills</b></p> <ul style="list-style-type: none"> <li>▪ Classroom policies &amp; procedures</li> <li>▪ Ethics               <ul style="list-style-type: none"> <li>→ Work</li> <li>→ Business</li> </ul> </li> <li>▪ Sexual harassment laws</li> <li>▪ Personal skills, including positive attitude, self-confident, honesty, perseverance &amp; self-discipline</li> <li>▪ Professional appearance</li> <li>▪ Time management</li> <li>▪ Lifelong learning</li> </ul>	<p><b>1. Understand how personal skill development, including positive attitude, honesty, self-confidence, time management, &amp; other positive traits affect employability.</b></p> <ul style="list-style-type: none"> <li>▪ Demonstrate and understand classroom policies &amp; procedures</li> <li>▪ Define work and business ethics &amp; demonstrate the importance of ethical standards &amp; social responsibilities in the business environment.</li> <li>▪ Discuss the laws applicable to sexual harassment &amp; discuss tactics for handling harassment situations.</li> <li>▪ Demonstrate personal skills in class and/or business environment:               <ul style="list-style-type: none"> <li>→ Positive attitude</li> <li>→ Self-confidence</li> <li>→ Honesty</li> <li>→ Perseverance</li> <li>→ Self-discipline</li> </ul> </li> <li>▪ Demonstrate and model personal hygiene and acceptable professional attire</li> <li>▪ Prioritize tasks and meet deadlines</li> <li>▪ Explain the importance of lifelong learning</li> </ul>	<p>Integrated in content area skills</p>

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
<p><b>2. Interpersonal Skills</b></p> <ul style="list-style-type: none"> <li>▪ Group dynamics</li> <li>▪ Conflict resolution and negotiation</li> <li>▪ Team work</li> <li>▪ Etiquette across gender and cultural groups</li> </ul>	<p><b>2. Understand principles of effective interpersonal skills, including group dynamics, conflict resolution, and negotiation.</b></p> <ul style="list-style-type: none"> <li>▪ Identify and explain the key concepts of group dynamics</li> <li>▪ Discuss and demonstrate the dynamics of conflict resolution and negotiation, and their importance within the business environment</li> <li>▪ Demonstrate effective teamwork, share responsibilities, accept supervision and assume leadership roles</li> <li>▪ Demonstrate cooperative working relationships and proper etiquette across gender and cultural groups</li> </ul>	<p>Integrated in content area skills</p>
<p><b>3. Thinking and Problem-Solving Skills</b></p> <ul style="list-style-type: none"> <li>▪ Critical and creative thinking skills</li> <li>▪ Logical reasoning and problem-solving skills</li> <li>▪ Numerical estimation, measurement, and calculation</li> <li>▪ Identify, locate, and organize needed information and propose, evaluate, and select alternative solutions</li> </ul>	<p><b>3. Understand the importance of critical thinking and problem-solving skills in the workplace.</b></p> <ul style="list-style-type: none"> <li>▪ Apply critical and creative thinking skills in a work environment and implement a plan of improvement as needed</li> <li>▪ Demonstrate logical reasoning and problem solving skills in a work environment</li> <li>▪ Apply numerical estimation, measurement and calculation skills to business applications including the following: <ul style="list-style-type: none"> <li>→ Whole number math</li> <li>→ Decimals &amp; fractions</li> <li>→ Counting &amp; monetary functions</li> <li>→ Use of tables &amp; graphs</li> </ul> </li> <li>▪ Recognize problem situations; identify, locate and organize needed information, and propose, evaluate and select from alternate solutions</li> </ul>	<p>Integrated in content area skills</p>

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
<p><b>4. Communication Skills</b></p> <ul style="list-style-type: none"> <li>▪ Written communications</li> <li>▪ Verbal and Nonverbal communications</li> <li>▪ Active and effective listening</li> <li>▪ Proper etiquette in business communications</li> <li>▪ Writing and editing skills</li> <li>▪ Use of reference material and handbooks</li> <li>▪ Oral presentations</li> </ul>	<p><b>4. Understand principles of effective communication.</b></p> <ul style="list-style-type: none"> <li>▪ Read and implement written instructions, technical manuals, written communication, and reference books</li> <li>▪ Present a positive image of verbal and nonverbal communication through use of appropriate methods</li> <li>▪ Demonstrate active and effective listening skills through verbal, nonverbal and written feedback</li> <li>▪ Demonstrate proper etiquette in business communications, including an awareness of requisite for international communications (languages, customs, and time zones)</li> <li>▪ Demonstrate the following writing and editing skills: <ul style="list-style-type: none"> <li>→ Use correct grammar, punctuation, capitalization, vocabulary and spelling</li> <li>→ Write, proofread and edit</li> <li>→ Select and use appropriate forms of communication</li> </ul> </li> <li>▪ Exhibit a proficiency in the use of reference materials such as dictionary, thesaurus, telephone directory, almanac, zip code directory, and office handbooks</li> </ul>	<p>Integrated in content area skills</p>
<p><b>5. Occupational Safety</b></p> <ul style="list-style-type: none"> <li>▪ Good safety practices</li> </ul>	<p><b>5. Understand occupational safety issues, including avoidance of physical hazards</b></p> <ul style="list-style-type: none"> <li>▪ Model and implement good safety practices including: <ul style="list-style-type: none"> <li>→ Avoidance and reporting of physical hazards in the work environment</li> <li>→ Safe operation of equipment</li> <li>→ Proper handling of hazardous materials</li> </ul> </li> </ul>	<p>Integrated in content area skills</p>

CAREER PERFORMANCE STANDARDS	EXPECTED STUDENT OUTCOMES	HOURS
<p><b>6. Employment Literacy</b></p> <ul style="list-style-type: none"> <li>▪ Expand awareness of career opportunities</li> <li>▪ Set employment goals and objectives</li> <li>▪ Aptitudes, personal characteristics and interests</li> <li>▪ Develop portfolio to C-TAP standards</li> <li>▪ Develop interviewing techniques</li> </ul>	<p><b>6. Understand career paths and strategies for obtaining employment.</b></p> <ul style="list-style-type: none"> <li>▪ Explore career opportunities and develop a career plan</li> <li>▪ Identify steps for setting goals and writing personal goals and objectives</li> <li>▪ Examine aptitudes related to career options; relate personal characteristics and interests to educational and occupational opportunities</li> <li>▪ Develop a portfolio to include the following: <ul style="list-style-type: none"> <li>→ Letter of Introduction</li> <li>→ Cover letter</li> <li>→ Resume</li> <li>→ Thank you letter</li> <li>→ Job application</li> <li>→ Licenses, Certificates and Awards</li> <li>→ Transcripts</li> <li>→ Letters of Recommendation</li> <li>→ Work Samples</li> </ul> </li> </ul>	<p>Integrated in content area skills</p>
<p><b>7. Technology Literacy</b></p> <ul style="list-style-type: none"> <li>▪ Apply Industry specific technology</li> <li>▪ Use Industry specific software</li> <li>▪ Demonstrate Keyboarding</li> <li>▪ Accessing information</li> <li>▪ Lifelong enhancement of technology skills</li> </ul>	<p><b>7. Understand and adapt to changing technology.</b></p> <ul style="list-style-type: none"> <li>▪ Identify and demonstrate use of appropriate technology</li> <li>▪ Identify and use industry specific software</li> <li>▪ Demonstrate proficiency in alphanumeric keyboarding</li> <li>▪ Input and retrieve information</li> <li>▪ Understand the importance of lifelong learning in adapting to changing technology</li> </ul>	<p>Integrated in content area skills</p>

## ADDITIONAL RECOMMENDED /OPTIONAL ITEMS

**ARTICULATION:**                   None

**VOCATIONAL CREDIT:** 10 High School credits per 180 hours per year,  
qualifies for Vocational Arts graduation requirement

**ACADEMIC CREDIT:** 10 High School credits per 180 hours per year,  
qualifies for Vocational Arts graduation requirement

### **INSTRUCTIONAL STRATEGIES:**

Classroom lecture  
Classroom demonstration  
Reading assignments  
One-on-one student/instructor interaction  
Individual student projects  
Collaborative recording and live sound sessions  
Field trip to recording studio

### **INSTRUCTIONAL MATERIALS and Resources**

*Real World Digital Audio*, Peter Kirn (text approval pending)  
*Garage Band*, Apple Computer  
*Practica Musica*, Ars Nova Software  
*Sibelius*, Sibelius  
*Reason*, Propellerheads  
*Pro Tools*, Digidesign

### **Certificate Competency List**

Demonstrate workplace basic skills and behaviors.  
Identify cables and connectors including: XLR, ¼" TS, ¼" TRS, RCA.  
Understand line-level vs mic. level signals.  
Setup and operate a multi-channel audio recording console.  
Setup and operate a mixing board in a live sound application.  
Understand microphone types, usages and placements.  
Create soundtrack for a poem utilizing Garage Band.  
Create remix utilizing Garage Band.  
Complete basic level of music theory/aural skills via Practica Musica.  
Demonstrate basic notational skills utilizing Sibelius.  
Create original musical compositions utilizing Reason.  
Track, edit, mix and master audio for CD production utilizing Pro Tools.  
Use effective job employment skills.