1. **COURSE ID:** MUS. 292  
**Title:** Sound Creation: Sampling and Synthesis  
**Units:** 3.0 units  
**Hours/Semester:** 32.0-36.0 Lecture hours; 48.0-54.0 Lab hours; and 64.0-72.0 Homework hours  
**Method of Grading:** Grade Option (Letter Grade or Pass/No Pass)  
**Prerequisite:** MUS. 290

2. **COURSE DESIGNATION:**  
   Degree Credit  
   Transfer credit: CSU; UC

3. **COURSE DESCRIPTIONS:**  
   **Catalog Description:**  
   Create original sounds for composition, live performance, and sound effects. Fully utilize the technical and artistic potential of synthesizers and samplers. Study the nature of musical instruments and environmental sounds. From an historical as well as a technical perspective, analyze synthesized and sampled sounds found in experimental and popular music. Specific synthesis techniques covered include: analog modular synthesis, FM synthesis, additive synthesis, granular synthesis and physical modeling.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**  
   Upon successful completion of this course, a student will meet the following outcomes:  
   1. Describe the theory behind various synthesis and sampling techniques  
   2. Create original sounds using analog and digital synthesis  
   3. Create original sounds by recording, editing and processing audio samples  
   4. Integrate original sounds into original music composition

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**  
   Upon successful completion of this course, a student will be able to:  
   1. Describe the theory behind various synthesis and sampling techniques  
   2. Create original sounds using analog and digital synthesis  
   3. Create original sounds by recording, editing and processing audio samples  
   4. Integrate original sounds into original music composition

6. **COURSE CONTENT:**  
   **Lecture Content:**  
   The Physics of Sound  
   How do human beings distinguish between sounds  
   Understanding timbre and the overtone series in musical instruments  
   The nature of sounds in our environment  
   Analog Synthesis  
   History of analog synthesis  
   Survey of analog synthesis techniques  
   Digital Synthesis  
   History of digital synthesis  
   Comparison of analog and digital timbres  
   Survey of digital synthesis techniques including: FM, Wavetable, Fourier, Granular Synthesis and Physical Modeling  
   Sampling  
   History of sampling  
   Ethical and legal issues involving sampling  
   Survey of sampling techniques including: making beats from samples, acoustic instrument emulation, creating special effects sounds, vocal sampling  
   Comparison of sampling live audio vs pre-recorded material  
   Creating Original Music using Original Sounds  
   History of electronic music related to synthesis and sampling  
   Survey of digital music tools for sound design and composition
Lab Content:
1. Create sounds using the following modular analog synthesis techniques:
   - ADSR envelope generators
   - LFO Controllers
   - Filter Sweeping
   - Sample and Hold
   - AM, FM and Ring Modulation
   - Envelope Following
2. Create sounds using the following digital synthesis techniques:
   - Digital FM Synthesis
   - Additive (Fourier) Synthesis
   - Wavetable Synthesis
   - Physical Modelling
   - Granular Synthesis
3. Create sounds using sampling techniques:
   - Looping
   - Editing and Truncating
   - Reversing
   - Cross-fading
   - Pitch-shifting
4. Audio and MIDI signal processing for sound design
   - Modify sounds via reverb, chorusing, delay, feedback etc.
   - Create original sound effects via plug-ins and hardware digital signal processors
   - Control timbre in real-time performance
   - Map MIDI real-time controllers
5. Create original musical works incorporating original sound design
   - Use original analog and digital synthesized sounds in a composition
   - Using original samples to create drumbeats and rhythm tracks
   - Using original samples to create special effects and simulate acoustic instruments

7. REPRESENTATIVE METHODS OF INSTRUCTION:
Typical methods of instruction may include:
A. Lecture
B. Lab
C. Other (Specify): 1. (Lectures) Lectures incorporate presentations, discussions and analysis of contemporary and historical sound creation practices and technologies. 2. (Labs) Labs provide demonstrations and hands-on instruction in pertinent sound design techniques including: analog synthesis, FM synthesis, granular synthesis, physical modeling and sampling. Musical examples of numerous electronic music genres and eras are presented and analyzed in the classroom and the lab. 3. (Listening Activities) Midterm and final projects give students the opportunity to combine theory, technology, and musical creativity into cohesive works. Works are critiqued by instructor and students. 4. (Creative Projects) Midterm and final projects give students the opportunity to combine theory, technology, and music creativity into cohesive works. Works are critiqued by instructor and students.

8. REPRESENTATIVE ASSIGNMENTS
Representative assignments in this course may include, but are not limited to the following:
Writing Assignments:
- Project proposals
- Project reports
- Concert program notes
Reading Assignments:
- Textbook reading assignments
- Related articles
Other Outside Assignments:
  Digital audio lab assignments
  Class presentation
  Creative musical projects
  Performance of original work

9. REPRESENTATIVE METHODS OF EVALUATION
Representative methods of evaluation may include:
A. Lab Activities
B. Projects
C. Quizzes
D. Students are evaluated on the basis of: written quizzes, lab assignments, oral presentation, creative projects and concert performance.

10. REPRESENTATIVE TEXT(S):
Possible textbooks include:

 Origination Date: September 2020
 Curriculum Committee Approval Date: October 2020
 Effective Term: Fall 2021
 Course Originator: Christine Bobrowski