

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

MU4171

Theory, History, and Design of Musical Instruments

Expanded Course Outline

Course Subject Area:	MU
Course Number:	4171
Course Title:	Theory, History, and Design of Musical Instruments
Units:	3
C/S Classification #:	C-04
Component:	Lecture
Grading Basis: (graded only, CR/NC only, student's choice)	Graded only
Repeat Basis: (may be taken once, taken multiple times, taken multiple times only with different topics)	Taken once
Cross Listed Course: (if offered with another department)	NO
Dual Listed Course: (if offered as lower/upper division or undergraduate/graduate)	NO
Major course/Service course/GE Course: (pick all that apply)	GE Course
General Education Area/Subarea: (as appropriate)	C-4
Date Prepared:	10.29.15
Prepared by:	Dr. Jessie M. Vallejo

I. Catalog Description

Theory, History, and Design of Musical Instruments (3)

A modern interpretation of organology, or the study and classification of musical instruments. Students will explore sound production by classifying and analyzing musical instruments. The class will also examine diverse concepts of musical instruments as tools or beings. All students will be required to design and build a prototype of a new instrument or adaptation of an already existing instrument.

3 lectures/discussion.

Course fulfills GE C-4, B-5, or D-4.

II. Required Coursework and Background

Complete GE requirements for area A, C-1, C-2, C-3, and lower divisions for at least B, C, or D.

III. Expected Outcomes

A. Class Outcomes

1. Students will be able to evaluate and analyze how sound is produced by musical instruments according to several classification systems, such as Hornbostel-Sachs.
2. Students will be able to evaluate and analyze the measurement of sound into different tuning systems.

3. Students will be able to describe and articulate various ways that musical instruments are made meaningful in diverse examples of human society, life, and expression.
4. Students will learn about musical instruments by designing, creating, and performing on at least one instrument, with written rationale and discussion of their creative process.

B. GE Learning outcomes met (from Cal Poly GE assessment committee):

This course is listed as a GE synthesis class because the student will draw from many disciplines, learning basic concepts and applying these to the research, design, construction, and performance of a musical instrument. Students will be required to integrate concepts from across disciplines (musicology, ethnomusicology, archaeology, anthropology, music performance, music education, music therapy, math, engineering, and business). An understanding of these concepts will be represented in creating a new instrument (research, design, build), composing for and performing on this instrument, and writing an essay that explains the research behind this instrument.

GE Program Learning outcomes applicable to this class and AREA C-4/B-5/D-4 are listed below with the applicable activity or assignment in parentheses (***bolded and italicized***).

I. Acquire foundational skills and capacities.

- a. Write effectively for various audiences.
(Pre- and post-class essay questions, and final project essay, including submission of drafts for approval and feedback.)
- b. Speak effectively for various audiences.
(Class discussions about reading assignments and course topics. Final project presentations.)
- d. Apply and communicate quantitative arguments using tables, graphs, and equations.
(Analyzing instrument models, designing and building one's own instrument. Building a monochord and an electronic theramin instrument with an Arduino kit.)

II. Develop an understanding of various branches of knowledge and their interrelationships.

- a. Apply scientific methods and models to draw quantitative and qualitative conclusions about the physical and natural world.
(Analyzing instrument models, tuning systems, and designing and building one's own instrument. Building a monochord and an electronic theramin instrument with an Arduino kit.)
- b. Analyze major literary, philosophical, historical or artistic works and explain their significance in society.
(Historically influential instrument classification systems and music treatises will be read, analyzed, and discussed.)
- c. Analyze the concepts, theories, and methods pertaining to cultural, economic, historical, political, or social institutions.
(Historical, political, and social institutions will be analyzed in the overview of the field of ethnomusicology and through readings and discussions about classification and tuning systems. Cultural, economic, and ecological principles and institutions will be

analyzed by means of case studies and discussions about diverse roles musical instruments occupy in societies, as well as issues pertaining to sustainability, how instruments are built, and out of which materials.)

d. Integrate concepts, theories, and examples from more than one field of study to identify problems, draw conclusions, and construct original ideas.

(Concepts, theories, and examples will be drawn from the fields of ethnomusicology, anthropology, music performance, ecology, and engineering. These will inform students' final essays and production of an original musical instrument or adaptation of an existing instrument.)

III. Develop social and global knowledge.

b. Apply principles, methods, value systems, and ethics to social issues confronting local and global communities.

(Class activities and assignments covered during weeks 4-5 [material culture], week 8 [modifying instruments, especially for people with physical handicaps], week 9 [sustainability of materials used to construct instruments], and weeks 10-11 [storing and displaying instruments].)

IV. Develop capacities for continued development and lifelong learning.

a. Analyze the behavior of individuals within the context of the social and natural environment, human sexuality, physical and mental health, and stages of life.

(All class activities and assignments.)

C. Music Student Departmental Learning Outcomes

Bachelor of Arts (BA)

1. Discuss and appraise the role of music in a balanced life, using appropriate vocabulary and examples.
3. Communicate effectively--verbally and in writing--about specific musical works and musicians, about the creative process in music, and about music's role in human culture.
4. Demonstrate creativity, musicianship skills (including those involving technology), and conceptual understanding.

Music Industry Studies option (BA)

1. Interpret relationships between music and: commerce; technology; media; and audience.

Bachelor of Music (BM)

4. Articulate the distinguishing characteristics of multiple musical styles, traditions, and historical periods, and apply that knowledge to performance.
6. Analyze, interpret, and defend judgments of various musical works for audiences of scholars and amateurs.
8. Promote musical culture in the community.
9. Think, speak and write clearly at the college level.

Composition option (BM)

1. Apply knowledge of compositional techniques and musical elements to write original compositions and works in new and established styles.

Pre-credential Music Education option (BM)

3. Evaluate, select, prepare, and assess music for performance
5. Differentiate sequential repertoire appropriate to general music classes.
6. Integrate specialized skills for teaching music literacy, including composition and improvisation

IV. Instructional Materials and Readings

Adkins, Cecil. 1967. "The Technique of the Monochord." *Acta Musicologica* 39:34-43.

Armstrong, Donna. 2015. "Interview with Scott Hackleman, Sitar Repair Specialist." *UCLA Department of Ethnomusicology News*. <<<http://www.ethnomusic.ucla.edu/scott-hackleman-interview>>>

Barber, Sarah B., Gonzalo Sánchez, and Mireya Olvera. 2009. "Sounds of Death and Life in Mesoamerica: The Bone Flutes of Ancient Oaxaca." *Yearbook for Traditional Music* 41:94-110.

Both, Arnd Adje. 2009. "Music Archaeology: Some Methodological and Theoretical Considerations." *Yearbook for Traditional Music* 41:1-11.

Duffin, Ross W. 2007. *How Equal Temperament Ruined Harmony: and Why You Should Care*. New York: W. W. Norton & Company.

Ellis, Alexander John. 1875. "Illustrations of Just and Tempered Intonation." *Proceedings of the Musical Association* 1:159-165.

Hill, Jonathan D., and Jean-Pierre Chaumeil, eds. 2011. *Burst of Breath: Indigenous Ritual Wind Instruments in Lowland South America*. Lincoln: University of Nebraska Press.

Kartomi, Margaret J. 1990. *On Concepts and Classifications of Musical Instruments*. Chicago: The University of Chicago Press.

Ledang, Ola Kai. 1990. "Magic Means, and Meaning: An Insider's View of Bark Flutes in Norway." *Selected Reports in Ethnomusicology* 8:105-123.

Lehman, Bradley. 2005. "Bach's Extraordinary Temperament: Our Rosetta Stone: 1." *Early Music* 33(1):3-23.

Marcus, Scott. 1993. "The Interface Between Theory and Practice: Intonation in Arab Music." *Asian Music* 24(2):39-58.

McGarry, Robert J. 1984. "Equal Temperament, Overtones, and the Ear." *Music Educators Journal* 70(7):54-56.

Nettl, Bruno. 2010. "Arrows and Circles: Fifty Years of the ICTM and the Study of Traditional Music." In *Nettl's Elephant: On the History of Ethnomusicology*, 146-158. Champaign, IL: University of Illinois Press.

———. 2005 [1983]. *The Study of Ethnomusicology: Thirty-one Issues and Concepts*. Champaign, IL: University of Illinois Press.

Provine, Robert C. 2007. "Music, Measurements, Pitch Survivals, and Bell Shapes in Korea." *The World of Music* 49(3):13-30.

Scott, Heather K., ed. 2001. *Violin Owner's Manual: The Complete Guide*. San Anselmo, CA: String Letter Publishing.

Seeger, Anthony. 1996. "Ethnomusicologists, Archives, Professional Organizations, and the Shifting Ethics of Intellectual Property." *Yearbook for Traditional Music* 28:87-105.

Stanley, Burton. 1978. *Instrument Repair for the Music Teacher*. Van Nuys, CA: Alfred Music.

Stock, Jonathan P. J. 2007. "Alexander J. Ellis and His Place in the History of Ethnomusicology." *Ethnomusicology* 51(2):306-325.

Stöckli, Matthias, and Arnd Adje Both, eds. 2013. *Flower World: Music Archaeology of the Americas, volume 2*. Berlin: Ekho Verlag.

Titon, Jeff Todd. 2009a. "Economy, Ecology, and Music: An Introduction." *The World of Music* 51(1):5-15.

Titon, Jeff Todd. 2009b. "Music and Sustainability: An Ecological Viewpoint." *The World of Music* 51(1):119-137.

V. Minimum Student Materials

Notebook, text, pencil, access to Internet and a computer, an Arduino kit to build a theramin (approximately \$35), tools to build an instrument of one's choosing.

VI. Minimum College Facilities

"Smart classroom" (capability of showing videos and films, sounds system for audio playback, Internet access)

VII. Course Outline

Week 1-2: Introduction & overview of organology, classification systems of musical instruments

Suggested readings or excerpts from: Kartomi, Nettl

Week 3: Tuning systems, measuring sound and instruments, build a monochord
Suggested readings or excerpts from: Adkins, Ellis, Lehman, Marcus, McGarry, Provine, Stock

Weeks 4-5: Material culture, instruments/artifacts, and their cultural meanings
Suggested readings or excerpts from: Hill/Chaumeil, Barber/Sánchez/Olvera, and Stökli/Both.

Weeks 6-7: Designing instruments, lutherie/building instruments, commercial instruments

Suggested readings or excerpts from: Ledang

Week 8: Repairing and modifying instruments

Suggested readings or excerpts from: Armstrong

Week 9: Materials and sustainability

Suggested readings or excerpts from: Both Titon articles

Weeks 10-11: Archives and museums, storing and displaying instruments, assessing and appraising instruments; departmental service to help staff technician with instrument collections

Suggested readings or excerpts from: Seeger

Week 12: Amplifying and recording instruments

Weeks 13-14: Electronic instruments and sound applications (“apps”), Arduino theramin

Week 15: Composing music for new instruments, presentations of instrument projects and performances

VIII. Instructional Methods

Classes will be taught via lecture, classroom discussion in large and/or small groups, and will include a variety of media formats. Discussions will center on assigned readings about special topics and issues for each week. Hands-on experiences with musical instruments will be used whenever possible.

IX. Evaluation of Outcomes

Evaluation of students will be based on the following:

- Engaged participation in class discussions, drawing from reading materials and class lectures
- A written midterm exam covering topics like classification systems in organology.
- A comprehensive final project and essay that will be approved by the instructor. The project will include researching, designing, and creating an instrument or an alteration of an instrument, and writing an essay about their creation or development. Essays will be submitted in stages (proposals, drafts) for feedback. For the project and essay, the student will synthesize and analyze ideas and issues discussed throughout the term, as well as

demonstrate the student's comprehension of musical instruments through the creation and performance of a sound-producing device. Depending on the class-size, students may work in small groups or ensembles.

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- d. Integrate concepts, theories, and examples from more than one field of study to identify problems, draw conclusions, and construct original ideas.
(Concepts, theories, and examples will be drawn from the fields of ethnomusicology, anthropology, music performance, ecology, and engineering. These will inform students' final essays and production of an original musical instrument or adaptation of an existing instrument.)

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IV. Develop capacities for continued development and lifelong learning.

a. Analyze the behavior of individuals within the context of the social and natural environment, human sexuality, physical and mental health, and stages of life.

(All class activities and assignments.)

X. Assessment of the Course

Students will be asked to submit pre- and post-class answers to the following question:

“Based on what you know now, in your opinion, what are we able to understand about human culture and our world from musical instruments?”

After grades have been turned in, students will be asked to submit a written anonymous answer to the following question:

“Did this course cause you to think in a synthetic way; i.e., did you make connections from several different categories of knowledge and disciplines?”

Written student work will be randomly and anonymously collected from both the beginning (online discussion prompts) and end of class (final essay) to test the recent GE learning outcomes that were put forth by the GE Assessment Committee in Winter 2015:

- Apply scientific methods and models to draw quantitative and qualitative conclusions about the physical and natural world.
- Analyze major literary, philosophical, historical, or artistic works and explain their aesthetic, historical and cultural significance in society.
- Analyze concepts, research methods, and theories pertaining to the study of culture, economics, history, politics, or society.
- Integrate concepts, examples, and theories from more than one discipline to identify problems, construct original ideas, and draw conclusions.
- Apply principles, methods, value systems, and ethics to social issues confronting local and global communities.
- Analyze the behavior of individuals within the context of the social and natural environment, human sexuality, physical and mental health, and stages of life.

Course authors will choose one of the above GE SLOs to test each time the class is taught.