

ORIGINATOR'S SECTION:			
1. College: <u>Arts & Sciences</u> Desired Term: <u>FALL</u> Summer and Year <u>2000</u> of implementation.			
2. Course is to be considered for G.E.? (If yes, also fill out appropriate GE form*) Yes <u>X</u> No _____			
3. Course will be a variable-topics (generic) course? Yes _____ No <u>X</u> ("generic" is a placeholder for topics)			
4. Course abbreviation and Number:* <u>PHYS 356</u>			
5. Title: (Titles using jargon, slang, copyrighted names, trade names, or any non-essential punctuation may not be used.) <u>The Science of Sound and Music</u>			
6. Abbreviated Title for Banner: (no more than 25 characters, including spaces) <u>Sci. of Sound & Music</u>			
7. Number of Units: <u>3</u>			
8. Catalog Description: (Not to exceed 80 words; language should conform to catalog copy. Please consult the catalog for models of style and format; include all necessary information regarding consent for enrollment, pre- and/or corequisites, repeated enrollment, crosslisting, as detailed below. Such information does <u>not</u> count toward the 80-word limit.) <u>An introduction to the physics of sound. Various aspects of the science of sound are covered including the nature of sound waves, their production, recording, and reproduction. The physics of musical instruments, digital synthesis of sounds, and the basics of room and auditorium acoustics are also studied. PREREQUISITE: ENTRY-LEVEL MATHEMATICS REQUIREMENT (ELM).</u>			
9. Why is this course being proposed? <u>As the Physics Department continues to grow, it is important for us to offer a broader range of courses that can be used as electives for students in various disciplines including our own, and for the upper division BB. A course on sound and its application in music, musical instruments, and basic acoustics is a standard offering in physics at many universities and is of significant interest to the VPA Department here. (See attached email.)</u>			
10. Mode of Instruction* (See pages 17-23 at http://www.calstate.edu/cim/data-elem-dic/APDB-Transaction-DED-SectionV.pdf for definitions of the Course Classification Numbers)			
Type of Instruction	Number of Credit Units	Instructional Mode (Course Classification Number)	
Lecture	3	C-02	
Activity			
Lab			

* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair.

11. Grading Method:*
 Normal (N) (Allows Letter Grade +/-, and Credit/No Credit)
 Normal Plus Report in-Progress (NP) (Allows Letter Grade +/-, Credit/No Credit, and Report-in-Progress)
 Credit/No Credit Only (C)
 Credit/No Credit or Report-in-Progress Only (CP)

12. If the (NP) or (CP) grading system was selected, please explain the need for this grade option.

13. Course Requires Consent for Enrollment? Yes No
 _____ Faculty _____ Credential Analyst _____ Dean _____ Program/Department - Director/Chair

14. Course Can be Taken for Credit More than Once? Yes No
 If yes, how many times _____ (including first offering)

15. Is Course Crosslisted: Yes No
 If yes, indicate which course _____ and check "yes" in item #22 below.

16. Prerequisite(s): Entry-Level Mathematics (ELM) requirement

17. Corequisite(s):

18. Documentation attached:
 Syllabus or Detailed Course Outline

19. If this course has been offered as a topic, please enter topic abbreviation, number, and suffix:*

20. How often will this course be offered once established?* Approximately once a year

PROGRAM DIRECTOR/CHAIR - COLLEGE CURRICULUM COMMITTEE SECTION:
 (Mandatory information - all items in this section must be completed.)

21. Does this course fulfill a requirement for any major (i.e., core course or elective for a major, majors in other departments, minors in other departments)? YES
 NO

If yes, please specify: ELECTIVE, PHYSICS MAJOR (PENDING ITS APPROVAL)

22. Does this course impact other discipline(s)? (If there is any uncertainty as to whether a particular discipline is affected, check "yes" and obtain signature.) Yes No
 If yes, obtain signature(s). Any objections should be stated in writing and attached to this form.

<u>VPA</u>	<u>ATTACHED: F. M. N. L.</u>	<input checked="" type="checkbox"/> Support	<input type="checkbox"/> Oppose
Discipline	Signature	Date	
_____	_____	_____	<input type="checkbox"/> Support <input type="checkbox"/> Oppose
Discipline	Signature	Date	

**SIGNATURES : (COLLEGE LEVEL) :
(UNIVERSITY LEVEL)**

<u>GRAHAM OBEREM</u> <u>3/14/05</u>	_____	_____
1. Originator (please print or type name) Date	5. UCC Committee Chair	Date
<u>Graham Oberem</u> <u>3/14/05</u>	_____	_____
2. Program Director/Chair Date	6. Vice President for Academic Affairs (or Designee)	Date
<u>[Signature]</u> <u>4/14/05</u>	_____	_____
3. College Curriculum Committee Date	7. President (or Designee)	Date
<u>[Signature]</u> <u>4/14/05</u>	_____	_____
4. College Dean (or Designee) Date		

Office of Academic Programs Banner: _____ Catalog _____ Revised 2/17/03

* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair

Dean's Office
RECEIVED
 MAR 15 2005
 BY: [Signature]

PHYS 356 – *The Science of Sound and Music*

Tentative Course Syllabus/Outline

Course objective: To introduce students to the science of sound. We will learn about the physics of sound waves and how this provides an understanding of how musical instruments work. We will also learn about analog and digital recording processes, and the digital synthesis of sounds.

Possible Textbooks: The Physics of Sound (3rd Ed.) by Richard E. Berg and David G. Stork
Physics and the Sound of Music (2nd Ed.) by John S. Rigden
The Science of Sound (3rd Ed.) by Thomas Rossing, F. Richard Moore, and Paul A. Wheeler

The first book on the list above is the one most appropriate for the proposed course.

The course would be comprised of the following modules. The amount of time spent on each module could vary from the estimates shown. The estimated times total 14 weeks. One week is being set aside for three exams each of which would take a full class period.

Module 1 – Sound Waves (2 weeks)

- Oscillations and vibrations
- Traveling waves
- Sound waves
- Standing waves and overtones
- Resonance
- Interference and beats

Module 2 – Complex waves (2 weeks)

- Pure tones
- Complex tones
- Frequency analysis
- Tonal quality
- Noise
- Voice and hearing

Module 3 – Recording and reproduction (3 weeks)

- Basics of electromagnetism
- Microphones
- Loudspeakers
- Amplifiers
- Tape recording
- Digital recording
- Analog versus digital

Module 4 – Musical Instruments (3 weeks)

- Woodwind instruments
- Brass instruments
- Stringed instruments
- Percussion instruments

Module 5 – Digital sound synthesis (2 weeks)

- Digital production of sounds
- Digital filtering
- Digital effects

Module 6 – Basic Acoustics (2 weeks)

Criteria in acoustical design

Control of reverberation

Auditorium design

Listening room design

There will be three course exams and a final, regular homework assignments, and a course project.
