

FIRST YEAR SEMINAR COURSE PROPOSAL
UNIVERSITY OF MARY WASHINGTON

Use this form to submit **FSEM 100 topics** courses for review **or any other existing course** that you wish to have designated to meet the first year seminar requirement.

COURSE NUMBER:	FSEM100XX		
COURSE TITLE:	SCIENCE, SOUND AND MUSIC		
SUBMITTED BY:	Bob Ekey, physics	DATE:	9/10/08
<i>This course proposal has the department's approval. (Put a check in the box to the right.)</i>			X

NOTE: *I have submitted two FSEM course proposals for the spring, this and a team-taught course with David Rettinger, psychology. I plan to teach one of these courses in the spring, but have submitted both for consideration. If a conflict arises in teaching the team taught course, I still want the opportunity to teach a FSEM in the spring.*

COURSE DESCRIPTION. In the space below, provide a one to two sentence description of this class. The description will be entered in Banner, and will also be used in other publications about the first year seminar program (such as the “Eagle Essentials” booklet).

This course examines the science of sound and music, exploring ideas including how sound is produced and perceived, the creation and interpretation of music and how musical instruments work.

RATIONALE. Using only the space provided in the box below, **briefly** state why this course should be approved as a first year seminar course.

Throughout the semester, students will be examining sound and music from a scientific and aesthetic perspective integrating their own personal experiences with ideas from several disciplines including, physics, music and psychology. Class time will include interactive lectures, demonstrations, laboratory activities and student-lead discussion. Assignments include individual and group work, and are meant to not only assess a student learning, but to foster the ability to design, research and present both written and oral ideas. The final project has the students designing, building and performing their own musical instrument. This will be an individual and group project, with a written and oral presentation about said instrument and a public performance with the class. Please see the following website for an idea of what the performance will be like. <http://www.juniata.edu/magazine/?p=16>

As an undergraduate, I used to say, “physics was my major and music was my passion”. I participated in a variety of music ensembles, enrolled in a course entitled “The Science of Musical Values”, and conducted my senior research on the “Sound and room acoustics; Application to the Cubiculo Dance Studio”. Since then, I have remained active as a singer and read a variety of texts relating science and music. I look forward to the opportunity to help students explore the wonders of sound and music, make connections with other musically inclined faculty and learn a bit myself.

SYLLABUS. *Attach a course syllabus.*

SUBMIT this form and attached syllabus **electronically as one document** to Warren Rochelle (wrochell@umw.edu) or Maya Mathur (mmathur@umw.edu). All submissions **must** be in electronic form.

University of Mary Washington
Department of Physics

Professor Bob Ekey
Email: rekey@umw.edu
Office: Jepson Rm. 422A
Phone: 540-654-1207

Syllabus
Science, Sound and Music – FSEM100X
Tu/Th, 12:30-1:45 pm (Suggested)
Spring 2009

Required Text:

The Physics of Music and Musical Instruments
Created by David Lapp, Wright Fellow, 2002-03

Found online at

www.tufts.edu/as/wright_center/workshops/workshop_archives/physics_2003_wkshp/book.htm
or just search for “The physics of Music and Musical Instruments” +Lapp

You may read it online or print yourself a black and white or color copy.

Other relevant and possibly useful texts and primary literature will be on reserve in the library and/or can be borrowed from my personal collection. Please see the list at the end of the syllabus.

Course Description:

This course examines the science of sound and music, exploring ideas including how sound is produced and perceived, the creation and interpretation of music and how musical instruments work. Throughout the semester, you will be examining these concepts from a scientific and aesthetic perspective integrating your own personal experiences with ideas from several disciplines including, physics, music and psychology. You will also learn how to find and use primary literature and sources to help broaden your understanding of a topic. Class time will include interactive lectures, demonstrations, laboratory activities and student-lead discussion. Assignments will include individual and group work, and are meant to not only assess your learning, but to foster the ability to design, research and present both written and oral ideas.

Expectations:

I expect you to engage the material, your peers and me both in and out of class in class related conversations. Some math will be required in this course involving mainly plugging numerical values into a given equation. I don't expect you to love math, but I expect you to try. At anytime during the course, when problems arise I expect you to seek assistance.

Goals:

I hope to expand your knowledge of science and how it relates to sound and music, further develop your conceptual and critical thinking skills and enable you to apply these ideas to real life situations. I also hope that you find at least one concept or application that excites or intrigues you and that by the end of the course, you will be better prepared to research, discuss and present ideas and concepts.

Attendance:

The success of this course relies heavily on class attendance and participation. Repeated absences from class will not only lower your participation portion of your grade, but may also affect your ability to complete assignments, since they will be related to what is covered during class. You will be held responsible for all course materials missed due to class absences. Please notify me PRIOR to class or deadline, by phone or email if you will be unable to attend class or turn in assignments because of an emergency or catastrophe.

Grading:

Your course grade is based on your individual work (35%), group work (25%), class participation/interaction (15%) and final project (25%).

Course Content:

The course is roughly divided into four parts.

Part I. Science

What it is, what it isn't and the scientific method. This will involve an individual assignment to explore how different people and groups define science and a group project exploring the number of circles that can be observed on campus walk. We'll also spend a day at the library to learn what resources are available for research.

Part II: Sound and Musical Instruments

Exploring how it is defined physically and psychophysically, the idea of pitch and intervals and how wind and string instruments work. This will include an individual assignment to help generate a dictionary of useful terms, an experiment involving resonances in a closed pipe, and a group project building instruments.

Part III: Music and Room Acoustics

How we interpret music and the effect of room conditions on what we hear. This will include an individual oral presentation describing and interpreting a piece of music both aesthetically and scientifically and a group project exploring different acoustics found in campus buildings.

Part IV: Your Own Musical Instrument

Bring it all together by designing, building and performing a musical instrument. This will be an individual and group project, with a written and oral presentation about said instrument and a public performance with the class.

Please see the following website for an idea of what the performance will be like.
<http://www.juniata.edu/magazine/?p=16>

The content found above is tentative and changes and additions may occur as the course evolves.

Office Hours:

You set the agenda for office hours. Come with questions related to class or anything else of concern or interest. Attend in groups or as an individual. If you would like to discuss something in private, please make a separate appointment. Below are my office hours for the spring semester, which are for students of this course and Phys 102 (General Physics).

<u>Monday</u>	<u>Tuesday</u>	<u>Wednesday</u>	<u>Thursday</u>	<u>Friday</u>
11:00 am - noon	9:15 - 10:30 am 3:00 - 4:00 pm	11:00 am - noon 4:00-5:00 pm	9:15 - 10:30 am 3:00 - 4:00 pm	9:00 - 10:00 am 1:30 - 4:00 pm

Additional office hours specifically for this course will be scheduled in class.

Additional Course Resources/Texts

Available in the Library or from my personal collection.

Science and Music

By: Sir James H. Jeans

The Physics of Sound

By: Richard E. Berg and David G. Stork

Music, Sound, Technology.

By: John M. Eargle

Sensation & Perception

By: Jeremy Wolfe

Measured Tones: The Interplay of Physics and Music

By: Ian Johnston

Musical Instrument Design: Practical Information for Instrument Making

By: Bart Hopkin

Horns, Strings, and Harmony

By: Arthur H. Benade

Musical Acoustics.

By: Donald E. Hall

Architectural Acoustics

By: M. David Egan

The Master Handbook of Acoustics

By: F. Alton Everest

The Journal of the Acoustical Society of America

The Physics Teacher