

## Course description Earth Water Science Song (SAS 42) Offered by Wendy Silk

**Course Introduction.** As demonstrated by the galvanizing impact of Al Gore's film *An Inconvenient Truth*, Americans are sensing an urgent need to understand interactions among human activities and our physical and biological environment. Paradoxically there is sometimes an emotional barrier to studying science to understand environmental resources, while music and poetry continue to be used to celebrate the beauty of the natural world. In this course students will fuse the intellectual power of environmental science with the emotional power of the performing arts. The series of 20 lectures will describe the occurrence and movement of water on earth, the natural history of soil formation, the role of plants and microbes, nutrient cycles, and some case studies of resource management to sustain human and natural ecosystems. Lake Spafford and Putah Creek on the UCD campus will serve as living laboratories. In studio (three hours/ week) students will communicate natural history and scientific concepts through exercises in song writing and poetry. Instead of a final exam, there will be projects to design, discuss and conduct public performances related to the functioning of the natural world.

### Expanded Course Description

1. **COURSE FORMAT AND REQUIREMENTS:**

Student workload is two hours of lecture, four hours of outside preparation, and three hours of studio for nine hours of work per week.

2. **TOPICAL OUTLINE:**

LECTURE

OUTLINE 1. Comparison of environmental science, music, and poetry as complementary human endeavors with which people understand and react to the natural world. 2. The hydrologic cycle. 3. Spatial and temporal variation on different size scales. 4. Surface water and groundwater. 5. Soil-- definition and natural history of its formation. 6. Plants—integrators of soil and water and basis of the food chain. 7. Nitrogen cycle—the importance of microbes. 8. Carbon, phosphorus, and sulfur cycles. 9. Human impacts--agriculture 10. Human impacts--global warming. 11. Case studies in soil and water management.

STUDIO OUTLINE: 1. Improvisation exercises. Inventory of student skills to be used in developing performance pieces. Identifying roles for individual students in the group projects (composer, musician, actor, lyricist, producer, historian, science consultant) Song rhythms. 2. Listening to sounds of nature. Listening to different genres of music. Song lyrics. 3. Creation of songs, first assigned topic. Depending on student skills, original musical pieces or traditional melodies with original lyrics will be written presented and discussed. Song melodies. 4. Creation of songs, second assigned topic. Song instrumentation. 5. Staging a performance. During weeks six to nine, students groups will create, rehearse, and critique a performance piece to communicate aspects of the lecture material. Rehearsals may be private (in the classroom) or more public (in the arboretum, farmer's market or K-12 classroom). 6. Dress rehearsal and a public performance in a campus theater or local art gallery.

3. **BASIS OF GRADING:**

Eight short essays written in class on science topics. The top five grades are counted: 20 % Two songs (group projects, written in studio, revised, rehearsed and performed): 25 % Two longer narratives giving the scientific background for each of the songs: 25 % Two peer evaluations and written descriptions of the creative process for group work: 5 % Contribution to end-of-term class performance: 25%