

# *Mathematics of Music*

## *Rhythm, tone, and self-expression*

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## **UC Irvine Cosmos 2009**

### **Course Outline**

Cosmos' *Mathematics of Music* cluster is an exploration of the connections between science and creativity as expressed through music. Students will compose using computer digital audio workstations and learn about computer music techniques while investigating the mathematical properties of various musical tuning systems and rhythms.

The connections between creativity and music technologies new and old prompt many questions; how do we improvise? What is musical expression? Why is music a human universal? *Mathematics of Music* is an attempt to learn about and discuss such questions in a new way. Singing, hand clapping, playing percussion, familiarity with music notation, and use of computers are central to this course.

- Week 1
  - Music as an art form
  - What is music production?
  - Scales and tuning systems I- pitch and the harmonic series
  - Rhythm; beginning to feel rhythms
  - Introduction to digital music production
- Week 2
  - Composing with the computer
  - Recording, mixing, and mastering
  - Scales and tuning systems II-temperaments and “pure” tunings
  - Rhythmic cells and clave
  - Collaborative composition
- Week 3
  - Starting the final composition project
  - Performing percussion pieces using rhythmic cells
  - Advanced computer music concepts
  - Skills to develop as a musician
  - Careers in music
- Week 4
  - Extended rhythmic concepts
  - Finishing the final composition
  - Next steps in research/learning about music
  - Music, the brain, and technology