



UNIVERSITY OF OREGON
School of Music and Dance

University of Oregon, School of Music

Course Title and Number: TBD
Credits: One (1)
Grades: P/NP
Meeting Time and Location: M-F 1:00-5:00 p.m.,
Rm: TBD
Dates: TBD
Instructor: Dr. Chet Udell
Telephone: (541) 346-8947
Email: cudell@uoregon.edu

Description of Course

The format of the CASCADE STE[A]M Institute will be a 2-week (40-hr) hands-on learning opportunity exploring the latest techniques, hardware, and software for employing wireless sensor networks to control the digital world around us, through project-based learning wherein teachers will create data-driven musical instruments, and then guide students in creating one of their own. Week one will focus on upgrading the skills and state-of-the-art knowledge of practicing teachers. Through hands-on workshops and lectures, teachers will be introduced to cutting-edge hardware and software, new methods, and lesson plans for instructing students in various STE[A]M activities. Week two of the institute will focus on reinforcement through teaching. Area middle-school students will participate one-on-one with a CASCADE teacher. Teachers will instruct students, applying the skills and curriculum learned in the previous week.

In week-two, middle-school students will be engaged in science and engineering lessons with technology-rich, hands-on experiences, which foster critical thinking, and engineering practices. Teachers will guide students in discovery and appreciation of the iterative creative process and learn to make use of technological resources which builds their confidence in pursuing future STE[A]M learning and careers. It is our hope that this informal hands-on learning experience will foster a heightened curiosity, awareness, and inspiration for these students to pursue STE[A]M based fields of inquiry in the future.

Course Objectives and Scope

Central Concept: We believe that principles of engineering and mathematics can be taught in compelling fashions and illustrated in beautiful and nuanced ways when done through the lens of hands-on workshops, building data-driven musical instruments. Through engineering and construction of data-driven musical instruments; translating gestures of the physical world into real-time data streams;

SCHOOL OF MUSIC AND DANCE

1222 University of Oregon, Eugene OR 97403-1225

T (541) 346-0763 F (541) 346-0723 music1.uoregon.edu

applying algorithmic processing and mapping strategies; and exploring how gestures in the real world can control the digital world around us; sophisticated concepts of engineering and mathematics will be articulated in beautiful, enthralling and memorable ways. **No experience in music, engineering, math, or physics is necessary, only basic arithmetic.** While we expect a wide representation of previous skills and interests, we expect everyone will be an experienced educator, interested in new curricula and technology, open to mixing disciplines from sciences and the arts.

By the end of the course, participants will:

- ✓ Develop specific instructional methods which result in increased student achievement in STE[A]M activities
- ✓ Acquire new knowledge of current technologies, methods, and practices
- ✓ Reinforce acquired knowledge through one-on-one teaching

Instructional Activities:

The activities of the CASCADE institute will include: an entrance survey, hands-on workshops designing data-driven musical instruments, lectures on the technology, strategies for pedagogical dissemination of this knowledge, individual projects, mid-term survey, reinforcement-through-teaching, and an exit survey.

Required Material:

- ✓ No materials will be required to participate in this course

Number of hours: 1 Credit = 40 total hours

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| ✓ Hands-on Workshops | 10 hrs |
| ✓ Individual projects | 5 hrs |
| ✓ Lectures | 5 hrs |
| ✓ Reinforcement-through-teaching | 15 hrs |
| ✓ Final Presentations | 5 hrs |

Evaluation:

Participants will receive a grade of Pass based on the following factors:

- ✓ Verified attendance and participation at the full workshop session (20%)
- ✓ Completion of entrance survey (10%)
- ✓ Completion and Demo of Data-Driven Musical Instrument (40%)
- ✓ Conceptual Understanding, based on mid-term and exit survey at the end of weeks 1 and 2 (30%)

It is University of Oregon grading policy that, for any graduate level class, a passing grade in a P/NP course will bear the equivalency of at least a "B" grade.

University Policy Regarding Students with a Disability

If you have a documented disability and anticipate needing accommodations in this course, please arrange to meet with me soon. Please request that the Accessible Education Center send me a letter verifying your disability.

Diversity at the School of Music and Dance

Students should be aware that the School of Music and Dance desires to discourage any sort of action that makes an individual feel uncomfortable or unwelcome. Students with concerns related to discrimination, bias, or sexual harassment are encouraged to contact the following office or offices should you wish to report such an incident and get help in resolving the incident.

- Affirmative Action and Equal Opportunity Office,
474 Oregon Hall, (541) 346-3123
- Bias Response Team, 164 Oregon Hall, (541) 346-1139
- Conflict Resolution Services, 164 Oregon Hall, (541) 346-0617
- Counseling Center, 210 Health and Counseling Center, (541) 346-3227
- Student Advocacy, 334 EMU, (541) 346-1141

If you are registered with the Accessible Education Center, you should make an appointment with the instructor as soon as possible to discuss any course accommodations that may be necessary. To request disability accommodations, register for services at the Accessible Education Center.

- Accessible Education Center, 164 Oregon Hall, (541) 346-1155