MUSC/MUEL 4121/5121 – syllabus *spring 2014*
ADVANCED TOPICS IN MUSIC TECHNOLOGY: *SYNTHESIS, DSP, AND ALOGORITHMIC COMPOSITION USING THE SUPERCOLLIDER LANGUAGE*

Class Sessions: 12:30 – 1:45 T, Th room N1B46 (CAML I)
Instructor: John Drumheller
Phone: (303)735-0272
Email: drumhell@stripe.colorado.edu
Web: http://stripe.Colorado.EDU/~drumhell/home.html
Office Hours: TBA
Texts: The following texts will be on reserve in the music library:
Dodge, Charles. *Computer Music: Synthesis, Composition and Performance*. New York, Schirmer, 1997.
Roads, Curtis. *The Computer Music Tutorial* . Cambridge, Masss.:MIT Press, 1994.
The following text is available on line: www.dspguide.com
Smith, Steven. *The Scientists and Engineers guide to Digital Signal Processing*. California Technical Publishing, 1997.
Materials: Notebook, music manuscript paper, USB Flash Drive, several blank CDRs, headphones with 1/8" and 1/4" adapter.

"The contemporary electronic music system has no predefined structure, but is initially a collection of possibilities – a set of variables or parameters such as pitch, loudness, space, timbre, etc., that exist in an undedicated state."
-Alan Strange

There are two primary objectives in this course. The first is to instill a philosophy of exploration where the student is always asking, "What happens if I do this?" Exploration and invention are crucial tools in the development of innovative software instruments and exciting compositions. The second objective is to become competent in the areas of music technology that are concerned with digital synthesis, digital signal processing, and algorithmic composition. The environment that will be used to explore these areas will be the SuperCollider 3 language, a powerful object-oriented programming language. SC3 will be used to create synthesis instruments, control interfaces, and compositions. Coursework will consist of daily assignments, larger scale projects, and a final project that will demonstrate a comprehensive understanding of the concepts and tools learned over the semester. There will also be several quizzes throughout the term.

Attendance: Due to the sensitive nature of the equipment, class attendance is vital to your understanding of how to operate the equipment safely. Each new technique covered in class brings about a new set of problems and procedures. You will be responsible for equipment damaged by negligence or ignorance because you missed instructions that were missed in class.

GRADING:

Daily Assignments	20%
Quizzes	20%
Projects	30%
Final Project	30%

Tentative Course Schedule:

Week 1 (1/15, 17) – Analog synthesis review – MOOG patching, parametric design and voltage control
Week 2 (1/22, 24) – Intro to SC3 – Language and OOP basics, sclang & scsynth, understanding the servers, evaluating code, error messages
Week 3 (1/29, 31) – Variables, comments, scale using mul and add, voltage control, vibrato, envelopes, triggers, gates, .ar, .kr, reciprocals
Week 4 (2/5, 97) – Intervals, multi-channel expansion, additive synthesis, random numbers, CPU usage
Week 5 (2/12, 14) – Subtractive synthesis, noise, message chains, Karplus/Strong, synthDef, server commands
Week 6 (2/19, 21) – FM/AM synthesis, sequencer, sample and hold, busses and nodes, groups, linking events
Week 7 (2/26, 28)– Synthesis project due
Week 8 (3/5, 7) – Numbers, operators, music functions, variables, arguments, expressions, user-defined functions
Week 9 (3/12, 14) – Iteration using .do, MIDI out, control using if, .do continued, arrays
Week 10 (3/18, 20) – Collections, arrays, index referencing, array messages, arrays of strings
Week 11 (3/26, 28) – Spring Break
Week 12 (4/2, 4/4) – More random numbers, Pbind, mutation, Pfunc, Pwrand, Pseries, Pseq, serialization
Week 13 (4/9, 11) – Markov chains, numerical data files,
Week 14 (4/16, 18) - Concréte, audio files, real time audio DSP
Week 15 (4/23, 25) – GUI basics
Week 16 (4/30, 5/2) – review and in class work

Final Project Due: Because there is no scheduled final exam time, the due date for the final project will be determined at a later date.

LEGAL STUFF:

If you qualify for accommodations because of a disability, please submit to your instructor a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accomodations based on documented disabilities. 303-492-8671, Willard 322, www.colorado.edu/disabilityservices

Teaching faculty shall make every effort to accommodate all students who, because of religious obligations, have conflicts with scheduled exams, assignments or attendance, provided they notify their instructor well

in advance of the scheduled conflict. Whenever possible, students should notify faculty at least two weeks in advance of the conflict to request special accommodation.
http://www.colorado.edu/policies/fac_relig.html

Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See polices at http://www.colorado.edu/policies/classbehavior.html and at http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at http://www.colorado.edu/policies/honor.html and at http://www.colorado.edu/academics/honorcode/

The University of Colorado at Boulder policy on Discrimination and Harassment (http://www.colorado.edu/policies/discrimination.html, the University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships applies to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550.