

21M.361 Composing With Computers

In this course we will use computers and computer-aided technology as compositional tools, that is, as a means to music-making and an avenue to approach musical and acoustic concepts. Each unit of study will consist of a series of short composition projects using specific types of hardware and software in clearly delineated ways. This will involve (in broad order) live recording and digital editing, digital processing, analog sound synthesis (real and virtual), MIDI sequencing, and building interactive environments. The course will culminate in a large, final composition and a public concert during the last week.

The weekly lectures will mainly be spent listening and reacting, both to each other's music and to those of other composers, historical and contemporary. Occasional guests will provide perspective on their own work in electronic composition, live computer-assisted performance, instrument design, and recording techniques.

The class will meet once a week for lab session. You will likely need to do most of your work there, scheduling your times on a weekly sign-up basis, and subject to **Studio Rules**. (Of course, if you have access to computers with sufficient capabilities, you are free to do your work outside of the studio.)

Class requirements consist primarily of composing music. It is imperative that you keep up with all assignments and that you turn in and/or present your compositions on time. There will also be listening and reading assignments and recommendations. The studio is Mac-based, and the course will principally center around Pro Tools, MAX/MSP, Peak, and Digital Performer, as well as the 'outboard' hardware in the lab.

Reserve List

Books

Cook (ed.), Music, Cognition, and Computerized Sound (ML3805.M8814 1999)
Dodge, Computer Music: Synthesis, Composition, and Performance (ML1092.D54 1997)
Nyman, Experimental Music: Cage and Beyond (ML197.N85 1999)
Roads, The Computer Music Tutorial (MT56.R6 1995)
Schaefer, New Sounds: A Listener's Guide to New Music (ML197.S235 1987)
Strunk (ed), Source Readings in Music History, v. 7 (ML160.s927 1998 v.7)
Winkler, Composing Interactive Music (MT56.W5 1998) - book and CD Rom

Library Reserve

Maryanne Amacher, "Head Rhythm 1" Sound Characters (CD PhonCD Am12 sou)
John Cage, "Imaginary Landscape #1" on Early Modulations: Vintage Volts (CD Ea76 mod)
Holger Czukay "Boat-Woman-Song" Ohm (PhonCD oh4 ear)
Arnold Dreyblatt, "High Life" from Propellers in Love (PhonCD D8248 pro)
Brian Eno, "Music for Airports 1/2" from Music for Airports (Phon En64 sel)

Ellen Fullman, "Over and Under" "Space Between" Body Music (PhonCD F959 body)
Vittorio Gelmetti, "Treni d'onda a modulazione d'intensita" Early Modulations: Vintage Volts (CD Ea76 mod)
Ryoji Ikeda, "Headphonics" (Track 1) +/- (PhonCD Ik3 hea)
Paul Lansky, More than Idle Chatter, Track 1, (Phon CD L292 sel)
Hugh LeCaine, "Dripsody" Ohm (PhonCD oh4 ear)
Alvin Lucier, "Music on a Long Thin Wire" (excerpt) Ohm (PhonCD oh4 ear)
Meredith Monk, "Hey rhythm" "Cow song", Our lady of late, (PhonCD M749 our)
Radiohead, "Idioteque", Kid A (PhonCD P R118 kid)
Steve Reich, "Come Out" Early Works (PhonCD R270.8 ear)
Raymond Scott, "Cindy Electronium" Ohm (PhonCD oh4 ear)
Snd, "Circa 1666", Clicks & Cuts 2, CD 1, Track 1 (PhonCD C611 cut2)
Karlheinz Stockhausen, "Studie 2" Elektronische Musik 1952-1960 (PhonCD Sto62 sel)
Morton Subotnick, "Silver Apples of the Moon" (excerpt) Ohm (PhonCD oh4 ear)
Nobukazu Takemura, "Icefall" Scope (PhonCD T1395 sco)
James Tenney, "Critical Band" On Edge (PhonCD R279 on)
Tuva Among the Spirits., Tracks 1,2,3 (PhonCD F G7270.T883)
Iannis Xenakis, "Concret PH" Early Modulations: Vintage Volts (CD Ea76 mod)
Richard Wagner, Overture to Das Rheingold (PhonCD W125 ring rh a), Track 1

Additional CDs on library reserve

Beatles "Revolution #9", The Beatles [White Album] (Phon CD P B38)
Gavin Bryars, Jesus Blood Never Failed Me Yet (Phon CD B842 jes)
John Cage, Indeterminacy (PhonCD C117 ind)
Cologne WDR (PhonCD C714 wdr)
Early Modulations: Vintage Volts (CD Ea76 mod)
Ensemble D'ondes Martinot (PhonCD En 764 don)
Bernhard Gunter - un peu de neige salie (999903 precat)
Jimi Hendrix, Experience Hendrix (PhonCDPH385exh)
Pierre Henry, Variations Pour une Porte (Phon CD H396 var)
Historical CD of Digital Sound Synthesis (PhonCD C7393 cmc13)
Alan Lamb, Primal Image (PhonCD L165 pri)
Paul Lansky, Alphabet Book (1122714 precat)
Alvin Lucier, Crossings (PhonCD L963.2 cro)
Alvin Lucier, I Am Sitting in a Room (PhonCD L963.2 iam)
Conlan Nancarrow, Studies for Player Piano (PhonCD L5525, all volumes)
Ohm: The Early Gurus of Electronic Music (CD Oh4 ear)
Orbitones, Spoon Harps and Bellowphones (CD Or113 spo)
Riley/Bang On A Can, In C (Phon CD R455 in)
Morton Subotnick, Silver Apples of the Moon (PhonCD Sub16 sil)
James Tenney, "For Ann Rising" from Selected Works (Phon CD T257 sel)
LaMonte Young, "String Quartet" on Arditti Quartet, USA (PhonCD Ar28 usa)
Evan Ziporyn, Gamelan Galak Tika (PhonCD Z679 amok)

Video

"Theremin"

Part One - Sound Structures (Week #1 to Week #3)

Sound objects: their collection, manipulation, and organization. The old school name for this is **musique concrete**, that is, music made entirely of found sounds. This will involve collecting sounds on tape or disc, transferring them digitally onto Pro Tools editing software, organizing them in various ways, and, finally, burning them onto CD.

Part Two - We Value Your Feedback (Week #4 to Week #5)

A short project evoking the natural language of electronic objects, speaking among themselves. The sounds for this project will be completely generated in the studio, by the equipment itself. First, we will generate and digitally record feedback in real time using amplifiers and microphones. We will then enhance and alter this sound using outboard filters and delays, as well as recursive recording within Pro Tools. You will then make a 5-7 minute piece with **no processing** and **no pasting** - only cutting and layering.

Part Three - Structuring Sound (Week #6 to Week #8)

Fundamentals of acoustics, harmonics, and timbre. We will continue our work with live recordings, processing them with convolution, compression, filtering, and other devices, soft and hard. Your raw materials can be any of the sound files you've created for the previous pieces. Each student will be randomly assigned one of your classmate's first projects, and you will use this as a formal basis for your own piece.

Part Four - Interaction (Week #9 to Week #11)

The concept of music as an interactive environment and/or as algorithm. We will dip our toes into the Max/MSP programming environment, and then device Max patches which generate defined but not necessarily predictable musical results. Along the way, we will learn the basics of simple AM and FM synthesis.

Part One - Sound Structures

Lecture One - Sound as Structure

Music:

Pauline Oliveros, "Teach Yourself to Fly" from Sonic Meditations - to be performed in class

John Cage, 4'33"

Tuva Among the Spirits, Tracks 1,2,3 (PhonCD F G7270.T883)

Lab One - Basic Pro Tools and Studio Technique

Handout: “Studio Rules”

Assignment: Using any equipment of any quality at your disposal, record at least 6 'single sounds' (you can record more if you like), and one longer sonic event (1-2 minutes). Take all your sounds and record them onto Pro Tools. Use simple editing functions to trim extraneous sounds and sequence them appropriately. Save the sounds as sound files, convert them to AIFF ('bounce to disk'), and burn a CD.

Lecture Two - Musique Concrete

Music:

Hugh LeCaine, "Dripsody" Ohm (PhonCD oh4 ear)

Alan Lamb, Primal Image (PhonCD L165 pri)

Holger Czukay "Boat-Woman-Song" Ohm (PhonCD oh4 ear)

Steve Reich, "Come Out" Early Works (PhonCD R270.8 ear)

Lab Two - Pro Tools Editing

Assignment: Two Parts: 1) Using Pro Tools editing functions only (i.e., no processing), use your short sounds to make a 1-2 minute piece of musique concrete. Again, convert, burn, and bring to class.

2) Using a notation system discussed in class or one of your own devising, make a structural map of your longer sonic event.

Lecture Three - Form

Music:

John Cage, “Williams Mix”, Early Modulations: Vintage Volts (CD Ea76 mod)

Iannis Xenakis, "Concret PH" Early Modulations: Vintage Volts (CD Ea76 mod)

DJ Shadow, Endroducing

Matthew Herbert, “Starbucks” (MP3)

Evan Ziporyn, “Postcard” from No Return

Lab Three - Pro Tools Editing continued

Assignment: Using your structural map as a working score, and using your short sounds as material, construct a new piece, again using exclusively Pro Tools editing functions.

Part Two - We Value Your Feedback

Lecture One - Feedback

Music:

Alvin Lucier, I Am Sitting in a Room (PhonCD L963.2 iam)

Phil Kline, “Bachman’s Warbler” on Bang On A Can, Vol. 3

Lab One - Controlling Feedback in the Studio

Assignment: Using only sound equipment in the studio, generate feedback and record it onto Pro Tools. You can then add layers using the outboard filters and delay units, as well as by routing the sound onto itself within Pro Tools. Try to record a continuous pass of evolving sound, 5-7 minutes in length.

Lecture Two - Rough Drafts

Music:

Michael Gordon, "Industry" from Bang on a Can Classics

Glenn Branca, "Movement Within" from Renegade Heaven

Merzbow - TBA

Jimi Hendrix, Experience Hendrix (PhonCD P H385 exh)

John Cage, "Imaginary Landscape #5"

Lab Two - Feedback Processing

Assignment: Sculpt your material into a 5 minute piece. Record as many layers as necessary, and feel free to cull both vertically and horizontally. For this project, I'd like you to limit yourself to cutting and layering - no pasting! Finally, we'll use these pieces as raw material for a performance of John Cage's "Imaginary Landscape #5."

Part Three - Structuring Sound

Lecture One - Introduction to Acoustics

Music:

Arnold Dreyblatt, "High Life" from Propellers in Love (PhonCD D8248 pro)

Alvin Lucier, "Music on a Long Thin Wire" (excerpt) Ohm (PhonCD oh4 ear)

Ellen Fullman, "Over and Under" "Space Between" Body Music (PhonCD F959 body)

James Tenney, "Critical Band" On Edge (PhonCD R279 on)

Meredith Monk, "Hey rhythm" "Cow song", Our lady of late, (PhonCD M749 our)

Lab One - Software Plug-Ins

Assignment: For this project, you'll be randomly assigned one of your classmates previous compositions - you will use this as a secret model for your own next piece.

- 1) Make a structural map, foregrounding whatever aspects of the model you find relevant.
- 2) Using plug-ins in Pro Tools and Peak, and using your previous recordings and drafts (from Parts One and Two) as source material, begin creating material for use in this piece. Select 5 interesting sounds created in this manner, burn them to CD, and bring them to class.

Lecture Two - Processing: Filters, Reverb, Compression, Convolution

Music:

Karlheinz Stockhausen, "Studie 2" Elektronische Musik 1952-1960 (PhonCD Sto62 sel)

James Tenney, "For Ann Rising" from Selected Works (Phon CD T257 sel)

Bernhard Gunter - un peu de neige salie (999903 precat)

Richard Wagner, Overture to Das Rheingold (PhonCD W125 ring rh a), Track 1

Lab Two - DSP 2

Assignment: Make a rough draft of your next project, burn it to CD.

Lecture Three - Rough Drafts

Music:

Peter Whincop, "Hi" (MP3)

Ryoji Ikeda, "Headphonics" (Track 1) +/- (PhonCD Ik3 hea)

Maryanne Amacher, "Head Rhythm 1" Sound Characters (CD PhonCD Am12 sou)

Lab Three - DSP2

Assignment: Finish work on this project.

Part Four - Interaction

Lecture One - Synthesis

Music:

John Cage, "Imaginary Landscape #1" on Early Modulations: Vintage Volts (CD Ea76 mod)

Paul Lansky, More than Idle Chatter, Track 1, (Phon CD L292 sel)

Raymond Scott, "Cindy Electronium" Ohm (PhonCD oh4 ear)

Radiohead, "Idioteque", Kid A (PhonCD P R118 kid)

Tristan Murail, "Mach 2.5" from Ensemble D'ondes Martinot (PhonCD En 764 don)

Morton Subotnick, Wild Bull (PhonCD Sub16 sil)

Lab One - Max/MSP 1

Assignment: Do the Max Tutorials through the Second Quiz.

Lecture Two - Process

Music:

Terry Riley/Bang On A Can, In C (Phon CD R455 in)

Steve Reich/David Cossin, Piano Phase/Video Phase (web link)

Brian Eno, "Music for Airports 1/2" from Music for Airports (Phon En64 sel)

Lab Two - Max/MSP 2

Assignment: MSP Tutorials through FM.

Lecture Three - Interactive Music

Music:

Nobukazu Takemura, "Icefall" Scope (PhonCD T1395 sco)

Evan Ziporyn, "Amok 6" Gamelan Galak Tika (PhonCD Z679 amok)

Yoav Gel, "Yours Forever" at www.worldofawe.com

Lab Three - Max/MSP 3

Final Project: A composition or interactive environment, 3-5 minutes in length, based on all skills and techniques acquired in the class.