Music 360 — Avid Pro Tools
Syllabus

course number: Music 360
class time: Lecture I: T 3:30 — 4:30 PM
Lab: TBA
classroom: Rm 255a School of Music
lab fee: $20

instructor: Joseph Waters
office: Room 209
office hours: by appointment
e-mail: joseph.martin.waters@gmail.com
text: 619-750-7125

NOTE: The best way to get in touch with me is through e-mail or text.

This syllabus is understood to be a contract between instructor and student.
Expectations regarding performance, grading, course content and attendance are stated below. After reading this syllabus, students will sign and return the attached acceptance form. No grades for the exercises will be registered until the acceptance form is signed and turned in.

Student Learning Objectives: Above all else this is a course in music composition. Although the information presented in class will often be highly technical in nature, the primary focus will be on the creation of works of musical art. Diversity of style and approach is encouraged.

This course will concentrate on hard-disk recording, centered on the Pro-Tools platform and ancillary software. Included will be basic recording, editing, sweetening and mastering techniques, as well as techniques for creative sound design. In addition there will be an ongoing exploration of classic and contemporary electro-acoustic literature in many styles.

Required Materials:

1) spiral bound notebook (you will be taking notes)
2) 7200 RPM Firewire Drive (Primary Recording Drive)
2) 1 TB USB backup HD
3) headphones w/1/4 in. phone plug;
4) $20 lab fee (paid with tuition)

Suggested Resources:

• Chadabe, Joel; Electric Sound — The Past and Promise of Electronic Music; Prentice Hall
• Roads, Curtis; *the computer music tutorial*, The MIT Press

• *Music Language & The Brain* (Ani Patel - NSI)

available used at Amazon for $28.02 (below)
  [http://www.amazon.com/s/ref=nb_sb_noss?url=search-alias%3Dstripbooks&field-keywords=patel+brain&x=0&y=0&ih=6_2_1_0_0_0_0_0_1.176_108&fsc=-1](http://www.amazon.com/s/ref=nb_sb_noss?url=search-alias%3Dstripbooks&field-keywords=patel+brain&x=0&y=0&ih=6_2_1_0_0_0_0_0_1.176_108&fsc=-1)

• *The Rest Is Noise: Listening to the 20th Century* (Alex Ross)
  available used at Amazon for $7.19 (below) & also as iBook
  [http://www.amazon.com/s/ref=nb_sb_noss?url=search-alias%3Dstripbooks&field-keywords=ross+rest+noise&x=0&y=0&ih=13_2_0_0_0_0_0_0_1.113_178&fsc=-1](http://www.amazon.com/s/ref=nb_sb_noss?url=search-alias%3Dstripbooks&field-keywords=ross+rest+noise&x=0&y=0&ih=13_2_0_0_0_0_0_0_1.113_178&fsc=-1)

• *Psychotic Reactions and Carburator Dung* (Lester Bangs)
  available used at Amazon for $5.42 (below)
  [http://www.amazon.com/s/ref=nb_sb_noss?url=search-alias%3Dstripbooks&field-keywords=ross+rest+noise&x=0&y=0&ih=13_2_0_0_0_0_0_0_1.113_178&fsc=-1](http://www.amazon.com/s/ref=nb_sb_noss?url=search-alias%3Dstripbooks&field-keywords=ross+rest+noise&x=0&y=0&ih=13_2_0_0_0_0_0_0_1.113_178&fsc=-1)

Assignments and other requirements: Each week a new concept, either aesthetic or technical in nature, will be presented in class. There will be a creative assignment (a short composition) based on this material that is due the following week. Students will play their creations for each other in class each week and offer positive criticism. Emphasis is on nurturing a warm, supportive environment for creativity.

In addition, each week a different student will choose and present an exemplary electro-acoustic work to the class. This will be critically listened to, analyzed and discussed from both technical and compositional points of view.

The culmination of the course will be a final composition project, to be presented at a concert. This will comprise the final exam for the course — a presentation of the works of the students. Attendance is mandatory and the public will be invited.

Student Outcomes:

• Students will know the basics of hard disk recording.
• Students will understand basic studio signal routing.
• Students will be able to identify and trouble-shoot basic recording studio physical layouts.
• Students will understand an array of techniques required for audio file editing.
• Students will know how to create symbiotic electro-acoustic creative work platforms.
• Students will understand digital clocks and synchronization issues.
• Students will be able to properly interconnect parallel digital audio work environments.
• Students will learn principles and techniques of professional sound design.
• Students will demonstrate knowledge of sound design by creating original audio environments.
• Students will demonstrate integrated understanding of all previous outcomes through the creation of original works of music that incorporate all of the techniques and knowledge outlined above.

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Grading: Course grade is based on:

I. Attendance — Missing class will result in grade dropping by .5 grade level.

II. Assignments — Missing an assignment will result in grade dropping by .5 grade level.

III. Mid-term Exam — This will comprise 50% total of the final grade

IV. Concert Attendance and Production: students will attend 2 Arts events approved by instructor.

• These can be music, visual arts, film or dance or hybrids.
• Events must be boundary-pushing in some way.
• suggested venues where such events often (not always) occur:
  
  Art Power (UCSD)
  Sushi Art Space
  MCASD (Museum of Contemporary Art San Diego)

Procedure:
  i. choose a likely event
  ii. submit to instructor for approval
  iii. bring ticket stub & receipt to instructor to receive credit

4. Master Class Attendance: There is one master class to which attendance is required. For this event there will be a sign-in sheet before the class and a sign-out sheet at the end
of the class. It is the student’s responsibility to find and sign both sheets. Failure to sign either one will result in no credit being given for attendance.

5. **Final concert production** — Sat. Dec. 1-2:— students will
• present an original electro-acoustic composition composed during the semester;
• volunteer for one of the many jobs necessary for presentation of a professional level public event.

*Missing concert or failure to participate in production will result in class failure.*

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**Lateness Policy:** Late-arriving students are very disruptive. Please make every effort to be early for class. Grade will be lowered .5 grade level for every 3 late arrivals of 5 minutes. Arrival later than 15 minutes will be counted as absent (grade will drop by .5 grade level).

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**Electronic Music Studio (EMS) Access:** After lab fee has been paid you will be allowed to sign up for lab time in the EMS. Each week you will have an assigned block of time during which the advanced workstation will be reserved for your use. You will issued a swipe card. 

& studio key.

**Entering and leaving EMS is a 4 step process:**

**TO ENTER:**

Step #1: Swipe your card at the door.

**CAUTION: YOU MUST SWIPE CARD FIRST, BEFORE OPENING THE DOOR. FAILURE TO DO THIS WILL RESULT IN THE POLICE COMING IMMEDIATELY.**

Step #2: Unlock the door and enter.

**TO LEAVE:**

Step #3: Close the door firmly behind you. It will lock automatically. Test the door to be sure that it is latched.

Step #4: Swipe your card. This will send a signal to Campus Police telling them that you have left.

**PLEASE NOTE:** You are responsible for the care and safe-keeping of the equipment in EMS while you are in the studio. Swiping your card tells the police exactly who is using the studio. If you leave the studio as another student is entering you MUST swipe out and then let the other student swipe in. This will transfer the legal responsibility for the equipment to the incoming student.
NOTE: When you arrive at the EMS, if the GREEN LIGHT IS ON (on swipe card unit), then somebody is already in the studio (or should be). DO NOT SWIPE – This will activate the infrared and any movement within the EMS will trigger an alarm. You may insert key and enter without swiping. When you enter, if no one is in the room, and the light was already green when you arrived, notify me immediately via phone (619) 750-7125.

EMS equipment use policy:
1) You are financially liable for any equipment that is broken or disappears while you are in the studio, or while your card swipe indicates that you are in the studio.

2) Under no circumstances is anyone who is not enrolled in the class to enter the studio.

3) Swipe cards are not to be loaned out. Loaning of swipe cards is grounds for dismissal from the class.

4) Studio key is not to be loaned out. Loaning of Studio key is grounds for dismissal from the class.

5) Losing studio Key will result in $310 fine. Failure to report immediate loss of key will result in dismissal from the class.

4) Because of the expense and delicacy of the equipment, you are only allowed to use EMS equipment that you have been trained upon in this class. Use of other equipment will be grounds for immediate dismissal. Further, no cables or equipment is to be disconnected or re-connected in any way except as demonstrated by the instructor.

Eating and drinking in the studio: Due to the delicacy of the equipment, eating and drinking in the studio is forbidden.

Bathroom breaks and general working procedure: The door to the studio must remain closed and locked at all times, whether or not you are in the studio. This keeps passers-by from entering while you are working.

Syllabus

Literature Pre-test
Students will be presented with an eclectic range of classic and contemporary electro-acoustic masterpieces, that they will identify by date, composer and title. Reasons for various answers will be compared in a round-table discussion.

Assign.: Bring in an example of electro-acoustic music to share and discuss with the class.

Students’ Literature Presentations
These will be critically listened to, analyzed and discussed from both technical and compositional points of view.

**PRO-TOOLS #1: General Overview**

- **Studio Routing: Work Station 1 & 2**

  - **Workstation 1 — overview**
    - 5.1 surround
    - front end: Coleman 5.1 Surround Controller
    - i/o: Pro Tools 192
    - Mic. pre:
      1. Millennia HV-3D (8 ch. analog)
      2. Berhinger 8 ch. digital

  - **Workstation 2 — overview**
    - 2 channel stereo
    - front end: Mackie Big Knob
    - i/o:
      1. Pro Tools 192
      2. Pro Tools 96
    - Mic. pre:
      1. Millennia HV-3D (8 ch. analog)
      2. Berhinger 2 ch. analog

- **Hardware Components**

  - 192 & 96 I/O – DACs/ADCs; analog ins/outs; AES3 (AES/EBU); SP/DIF, enclosure inputs
  - external HD — firewire drives
  - PCI hardware
  - mic./ pre-amp (Millennia)
  - K-2600/k-2661S
  - Onscreen Mixing vs hardware surfaces

- **Building a basic session**

  - hardware setup
  - I/O setup
  - sample rates: 44.1 48, 88.2, 96
  - stereo vs. 5.1 surround
  - Hard Disk allocation
  - Mix window
  - Tracks window
  - Transport window
  - Voices vs. audio tracks
  - Input/output
  - creating tracks
  - Naming Tracks/Naming Files
regions vs. files
- Deleting unused audio
- from session
- from hard disk
- Transport controls

**assign: create a small collage using PT**

**PRO-TOOLS #2: Basic Editing**

1. Editing Tools
   a. grabber
   b. waveform
   c. trim
   d. zoom
      i. amplitude
      ii. time
   e. metatool

2. Editing Modes

3. cut, copy, paste, duplicate

4. making clean edits
   a. the waveform display (time domain)
   b. zero crossings

5. zoom key short-cut commands

**assign: create a rhythm track by applying editing tools to non-percussive sounds to create a strange drum kit.**

**PRO-TOOLS #3: Plug-ins**

*The Insert column*

1. What is reverb?
   1. reflected sound
   2. How is sound absorbed?
      ii. Pre-verb
      iii. Early reflections
      iv. Decay — reverb tail

   b. Amp Farm – classic guitar amp simulation

2. Delay Lines
   i. delay time
   ii. feedback
   iii. coordination with tempo
iv. classic uses
   · slap delay (bass/vocals)
   · sweetening vocals
   · bizarre FX
   · multi-tap delays

3. DSP limits (DSP Allocation window: **Allocator**)

**assign**: continue working on your rhythm track, add DSP

**PRO-TOOLS #4: DSP conservation**

DSP Conservation

1. **Sends Column**
   a. data busses
      i. i/o labels
      ii. assigning data busses
      iii. pre vs. post fader send control

2. **Auxiliary Inputs**
   a. mono vs. stereo
   b. assigning plug-in
   c. importing data bus

**assign**: 1. back up all sessions as data; 2. Setup a plug-in on an auxiliary input and port multiple tracks to it; 3. Continue working on your composition, using these techniques.

**PRO-TOOLS #5: Creating Stereo Pairs & Automation:**

I. Stereo Pairs
   1. grouping tracks
      a. panning
   b. group master list
   2. stereo plug-ins
      a. stereo busses

II. Automation
   1. track views
      a. waveform
      b. volume curve
      c. panning curve
      d. block
      e. changing size
   2. Automating plug-ins
      a. choosing parameters
      b. individual parameter curves
         i. windows
         ii. editing: placing/deleting markers (w/grabber & trim tools)

**assign**: Create a new, short composition using stereo files, or add stereo files to your ongoing composition. Employ extensive automation with volume, panning and plug-ins.
**PRO-TOOLS #6: Dither & Mastering basics**

I. Dither — definition/explanation
1. use in converting analog to digital
2. use in bit length reduction
3. pushing data up into the LSB
4. types
   · random number based
   · triangular
   · noise-shaping
5. precautions:
   · re-dithering
   · omission of dither

II. Mastering Basics
1. master fader
a. digital overs at all points in the recording chain
b. signal-to-noise ratio at all points in the recording chain
2. sub-mix stems
3. hiding tracks
4. mastering limiter: **Waves L-3**
   a. limiters — definition
   i. threshold
   ii. gain reduction
   iii. brick wall limiting
   iv. transients & human perception
   v. look-ahead limiting
   vi. 0 dBFS: digital zero — full scale digital words
   vii. real world scale threshold

**assign: Prepare your composition for mastering.**

**Pro-Tools #7: Bouncing To Disc And Cd Burning**

1. Bouncing procedures
a. for CD burning
b. for exporting tracks to MetaSynth
c. for pre-mixing
2. CD Burning (Audio)
   a. Toast CD-DA
      i. red book audio
      ii. disc-at-once
      iii. cross-fades/butt splices etc.
iv. changing levels w/o re-dithering
b. CDs with audio and data
i. Toast CD-ROM Pro

assign: Finish mastering your composition and burn a CD.

PRO-TOOLS #8: Connecting Digitally to K-2600 and Importing MIDI Files

1. digital connection w/K2600
   a. digital clocks (master/slave)
   b. K-2600 settings
   c. PT settings
2. MIDI tracks & PT
   a. importing sequences from Performer
      i. Performer prep.
         · extra tracks
         · Standard MIDI file format
         · Type 0 vs. type 1
         · Tempo maps
      ii. Pro Tools prep.
         · Import MIDI
         · tempo/meter changes
         · synth/channel selection
         · converting MIDI to digital audio
         * assigning tracks/digital connections

assign: Create a short composition in Performer. Transfer into Pro-Tools and prepare for mastering.

PRO-TOOLS #9: Intro to Sound Design—Plug-ins continued...

1. Non-Real-Time Plug-ins
   a. time compression/expansion w/o changing pitch
      i. splicing algorithms
      ii. sound quality vs. rhythmic accuracy
   b. pitch shift w/o changing file length
   c. file reversal
   d. remove DC offset
2. Delay-based FX
   a. reverb
   b. delay
   c. chorus
   d. flange
i. classic analog flange

e. doppler

**assign: Create a short composition involving intense file mangling**

**PRO-TOOLS #10: Compression — Waves Renaissance Compressor**

1. Compression – Waves Renaissance Compressor
   a. threshold
   b. ratio/slope
   c. gain reduction
   d. make-up gain
   e. attack
   f. release
   g. applications:
   i. while tracking
      · vocals
      · elec. Bass
      · snare/kick
   ii. in mix down

**assign: Explore compression in your compositions and demonstrate.**

**PRO-TOOLS #11 EQ — Waves Q-10**

1. graphic equalizers
   a. filter banks
2. parametric equalizers
3. paragraphic equalizers
   · Q
   · Shelving, bandpass/limit curves
     applications:
   · noise reduction/cleaning up tracks
   · removing mid-range honk
   · adding air and sparkle
   · special FX

**assign: Use EQ creatively to intensely or subtly alter some aspect of your composition.**
Sound Design — MetaSynth

1. importing audio
2. Picture Synth
   a. setting screen size
   b. scaling time
   c. setting up stereo
   d. color vs/sound stage
   e. pitch resolution grid
   f. blue octave grid
   g. painting/drawing tools
   h. transpositions
   i. scaling audio
   j. screen revolution
   f. importing pictures
3. Cross-convolution
4. Granular synthesis

- Introduction to Max/MSP

Concert Preparation
1. publicity
2. DJs/VJs
3. Audio crew
4. Video prep