University of Waterloo Stratford Campus
Global Business and Digital Arts 229
Hybrid Digital Media: Sound, Technology, and Design
Fall 2015
Wednesday 3-6 PM, Room 2024

Instructor and P.A. Information

Instructor: Jordan Mandel
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Course Description

Students will be introduced to a history of recorded sound, exploring topics ranging from the development of the phonograph, to portable playback devices, to digital recording and autotune. Not only will students develop a context within which to place their musical experiences, they will also learn practical skills as a foundation for the course's theoretical material. The course is structured to provide students with an understanding of sound as a designable medium like any other. Ultimately, this course aims to raise the level of refinement, appreciation, and understanding students bring to their audio work in all future endeavours.

Objectives

By the end of the course, students will:

1. understand the significance and potential of non-veridic recordings

2. be able to place new musical experiences within their historical context of recording

3. possess a practical and theoretical understanding of basic recording/ processing methods including:
    *   microphone use
    *   editing
    *   EQ (timbre)
    *   compression (dynamics)
    *   reverb (space)

4. be able to execute basic tasks using at least one DAW

Required Materials

All of the required content for the course will be available online. Links to this content will be provided on LEARN.

Resources

Sign up for an account at freesound.org. This website has a huge collection of recordings which you will use throughout the course, and beyond.

Create an account at SoundCloud where you can post your recording projects from the course.

Finally, the course relies on using a Digital Audio Workstation, or DAW. Tutorial instruction will be delivered using Ableton Live but will point toward general concepts so an alternative DAW may be used effectively. This may include Logic, Pro Tools, Cubase, FL Studio, Adobe Audition, or any other DAW of your choice. While many of these applications do cost money, you are also welcome to use Audacity, which is a powerful open-source DAW and can be downloaded for free at http://audacity.sourceforge.net.

Equipment

Headphones

Please bring a set of headphones to class. Over-ear or on-ear headphones are strongly recommended (as opposed to earbuds), in order to deliver a wider and more accurate frequency response. If you don't own a set of over-ear or on-ear headphones, a limited number will be available to borrow from media services.

Computer

We will be using computers for our practical work. Please bring your laptop to class with a DAW installed. Ableton Live is recommended, although not necessary. If you don't own a laptop or prefer not to bring it to class, you may work in pairs with someone who has one with them

Course Requirements and Assessment

Participation	20%
Listening Quizzes	10%
First Editing Exercise	5%
Quirky Recording Project	10%
Headphone Design	15%
Ambient Production	15%
Final Listening Test	5%
Chop & Swap Final project	20%
	100%

Participation

This mark is earned in three ways:

1. *Quality* contributions to class discussions,

2. Presentation of assigned readings within reading groups. You will be included in a group which will be responsible for reading and discussing the weekly materials outside of class. Every week, a random group will be called upon to give an outline of the week's readings and how it connects to the overall course material. You will not be responsible for covering any of the recommended readings; those are only for your personal interest.

Listening Quizzes

You will complete a very simple quiz during each class to improve your listening skills. Completing the quiz and submitting it will earn you full marks. The results of the quiz are for your own sense of progress.

Deliverables

*Please note: the following descriptions are to give you a broad sense of these projects. Each assignment will be accompanied by a more detailed description which will be posted to LEARN. Please refer to that description as the authoritative description of the project.

First Editing Exercise

You will be given a short recording of a speech. Edit it using the DAW of your choice. Change the meaning by chopping up words and putting them into a new order, using no clip longer than 3 seconds. Aim to change the meaning as much as possible, and get this to sound as smooth and 'natural' as possible by incorporating the editing methods we've learned during class.

The aim of this project is to increase your comfort using a DAW. Post this project to your SoundCloud account and submit the link through LEARN along with a 300-word writeup describing your work and the meaning you created.

Due: Monday Oct 5, Midnight

Quirky Recording Project

Find a speech. In a small group create two of your own 1-minute recordings of any segment of it. Make both of your recordings of the same segment of the speech, but record them in different locations/with different techniques. Completely ignore the recording best practices we've discussed in class.

Listen to your project and compare the differences between both of yours and the original recording. Create a short video with the excerpt of the original speech you recorded (1 minute), your two recordings (2 x 1 minute), and a description of what you learned from this assignment from listening back to your two recordings (2-4 minutes).

Post this video to YouTube and submit the link through the appropriate LEARN dropbox.

Due: Monday Oct 19, Midnight

Headphone Design

As we'll learn in class, headphones are a distinct listening medium which offer their own strengths and weaknesses. Often when designing sound, a happy balance is achieved in content that works well on a variety of playback systems, but excellently on none.

Your task in this assignment is to design a piece of music that explores the limits of what a specific set of headphones can offer. Explore the interaction between the left and right channels, and explore binaural recording and processing methods which harness what headphones can deliver and speakers cannot.

Post this piece on SoundCloud and in the track description include a 300-word writeup describing how you approached your work, as well as your findings with the specific headphones you used including the lowest and highest possible frequencies those headphones could reproduce, and the dynamic range you were able to detect. Finally, listen to this piece on a different set of headphones and also through loudspeakers and write about the difference in your listening experience.

For this assignment, you may use one of the following headphones, all of which are available from the Media Loans office: Audio Technica AT40X; Senal SMH-1000; Sennheiser HD400; Monoprice 108323.

Due: Monday Nov 2, Midnight

Ambient Production

Building on our class on ambient music and Muzak, create a piece of ambient music designed specifically for the Stratford Campus' atrium. The piece will be played through the MicroTile Wall's built-in Tannoy stereo speaker system.

The goal of this project is to consider how you can design a recording for a specific place. How can a piece of ambient music be created specifically for that place, which can emphasize its uniqueness rather than cover it up? Ensure you have read Brian Eno's essay Ambient Music, available in our syllabus.

Along with your piece, submit a 300-word statement on the approach you took, how this piece accentuates the environment for which it was designed, and what you learned from this work.

Paste your report into the track description on SoundCloud, and submit the link through the appropriate LEARN dropbox.

Due: Monday Nov 16, Midnight

Final Listening Test

Listening skills are extremely important in order to integrate the practical skills in this course. Your attendance quizzes will develop your ability to distinguish different frequencies. These will culminate in a short test at the beginning of the final day of class.

Wednesday Dec 2, 3:00-3:20

Chop & Swap Final Project

You will be provided with a small selection of speech recordings, and you will select one to work with. You will also be provided with several excerpts from readings we have covered throughout the semester which will serve as an inspiration point and a guiding principal for the meaning behind your project.

With the speech serving as the featured element, you will chop up your selection, process it, and layer it with other sounds to compose an audio production that's uniquely your own.

As you work, consider the intended tone and meaning of the speech you're using and edit it to convey your own meaning. Use any of the techniques we've learned during the course as you arrange this project, and consider how you can use these techniques to tell the story you aim to tell.

Take a copy of your recording home, and write a 500-word piece explaining the story you were aiming to tell in your project, elaborating on the methods you employed, how these methods support your story, and how your work fits into the context of the course. Finally, you will receive a link to a project from another class member. In addition to the report on your own work, write a 250-word analysis of this work, considering questions such as:

- what techniques do you hear?
- what feelings do the production techniques evoke?
- why do they evoke those feelings?
- what have we learned about, that can be connected with this work?
- what are some areas of opportunity for this production?

In-class portion due: Wednesday Dec 2, End of class (6 PM)
Written component due: Friday Dec 4, Midnight

Course Schedule

Date	Topic & Deadlines	Practical Skills	Resources (❖ = reading ◎ = video)	Projects Due (*note: projects are due on the Monday before class)
INTRO				
Sept 9	• course intro • what's a great recording? • the physics of sound		❖ Mandel, "F is for Frequency" ❖ Mandel, "O is for Overtone"	

THE FIRST RECORDINGS				
Sept 16	• sound before recording • phonograph and Edison • from wax to shellac to vinyl	Microphones: • angles • placement Volume	❖ Chicago Tribune, "The Future of the Phonograph" ❖ Sousa, "The Menace of Mechanical Music" ❖ Mandel, "D is for Decibel" *RECOMMENDED:* ❖ Mandel, "X is for XLR"	
EARLY INNOVATION				
Sept 30	• Radio, Tape, and the War • Les Paul, overdubbing, and multitrack	Editing Envelopes	❖ Mandel, "Z is for Zero Crossing" ◎ History of Magnetic Audio Tape ◎ Les Paul and Mary Ford on Omnibus *RECOMMENDED:* ❖ Creating the Craft of Tape Recordings	
PROCESSING: FROM REVERB TO AUTOTUNE				
Oct 7	• psychoacoustics • reverb, doubletracking, reverse guitar, echo, dub • autotune	Reverb, Delay	❖ How Humans Conquered Echo ❖ Mandel, "R is for Reverb" ◎ Know Your Meme: Autotune *RECOMMENDED:* ❖ Mandel, "V is for VST"	First Editing Exercise *Oct 5, Midnight*
STUDIO AS INSTRUMENT				
Oct 14	• The Beatles • one-man bands • studio best practices • designing records	EQ	❖ Eno, "The Studio as Compositional Tool" ❖ Mandel, "E is for Equalizer" ❖ Mandel, "T is for Timbre" *RECOMMENDED:* ❖ Mandel, "Q is for Q" ◎ Making of *Sgt. Pepper* ❖ Gould, "The Prospects of Recording" (*The Splendid Splice*)	

	SURROUNDED BY SOUND: STEREO AND BEYOND			
Oct 21	• loudspeakers • home theatre as a listening environment • working with many speakers • technological extension	Compression Limiter Ducking	❖ Radio Adds Third Dimension ❖ Mandel, "C is for Compressor" ◎ How Speakers Work ◎ Emil Torick: "Quadraphonic Sound" ◎ Dolby Atmos *RECOMMENDED:* ❖ History of Surround ❖ Mandel, "S is for Sidechain"	Quirky Recording Project *Oct 19, Midnight*
	PORTABLE AND PRIVATE LISTENING			
Oct 28	• headphones • music for all activities • music as lifestyle design • soundtracking & isolation	Panning Binaural processing	❖ Story Behind the Walkman ❖ Smithsonian History of Headphones ❖ Mandel, "H is for Headphones" ❖ The Argument Against Headphones ◎ Virtual Barbershop *RECOMMENDED:* ❖ How Headphones Changed the World ❖ Mandel, "J is for Jack"	
	AMBIENT AND MUZAK			
Nov 4	• Brian Eno, John Cage, Erik Satie • Music as a process • Music for environments • Architectural music	Warp effects Reverse Resampling	❖ Eno, "Ambient Music" ❖ Elevator Going Down: History of Muzak ❖ Mandel, "T is for Timbre" ◎ John Cage on Silence *RECOMMENDED:* ◎ Red Bull Music Academy: Brian Eno ◎ Imaginary Landscapes	Headphone Design *Nov 2, Midnight*

HEARING 0s AND 1s: DIGITAL

Nov 11	• Pro Tools and the era of visual editing • understanding digits • resolution • The end of scarcity	Modulation effects	❖ Music Players from Edison to the iPod ❖ The AudioFile: Basics of Uncompressed Digital Audio ❖ Mandel, "B is for Bit Depth" *RECOMMENDED:* ❖ What Data Compression Does To Your Music ❖ The Guardian: Napster ❖ Mandel, "A is for AIFF"	

BIG SOUND, LITTLE SOUND, AND AUDIOPHILIA

Nov 18	• Getting the most from a recording • Vacuum tubes • Hearing (and protection) • Equipment vs. attention	Loops Glitches	❖ The Esoteric Art of Great Sound ❖ Why Audiophiles Are Paying $1000 for This Man's Vinyl ❖ Despacio: the 50,000-watt sound system designed for discerning audiophiles *RECOMMENDED:* ❖ Mandel, "I is for Interface" ❖ Oswalds Mill Audio Loudspeakers ❖ Whatever Happened to the Audiophiles?	Ambient Recording Project *Nov 16, Midnight*

THE CURRENT & THE FUTURE

Nov 25	• Streaming • Apps • Generative music • Exploratory music		❖ Eno, "Generative Music" ❖ Mandel, "K is for KBPS" ❖ Eno on Music That Thinks for Itself ◎ TED: To Hear This Music You Have To Be There. Literally. *RECOMMENDED:* ❖ Station to Station: The Past, Present, and Future of Streaming Music	

IN CLASS PROJECT				
Dec 2	Final listening test Final project			• Final Listening Test • Chop & Swap Final Project (Audio Component)
(HAND-IN WEEK)				
Dec 7				Chop & Swap Final Project (Written Component)

Recommended Listening

Atoms For Peace. *AMOK.*

The Beatles. *Sgt. Pepper's Lonely Hearts Club Band.*

Eno, Brian. *Ambient 1: Music for Airports.*

Kode9 + The Spaceape*. Memories of the Future.*

Led Zeppelin. *Led Zeppelin IV.* esp. "When The Levee Breaks"

Lorde. *Pure Heroine.*

Majical Cloudz. *Impersonator.*

Massive Attack. *Mezzanine.*

Moby*. Play.*

Monokle & Galun*. In Frame.*

Nine Inch Nails. *The Downward Spiral.*

Oldfield, Mike. *Tubular Bells*.

Pink Floyd. *Dark Side of the Moon.*

Radiohead*. Amnesiac.* esp. "Like Spinning Plates", and "Hunting Bears"

Shigeto. *Full Circle.*

SOHN*. Tremors.* esp. "The Wheel"

Spoke And Mirror. *The Music is the Message.*

Stetson, Colin. *New History Warfare, Vol. 2: Judges*

Recommended Reading

Cage, John. *Silence.*

DeSantis, Dennis. *Making Music: 74 Creative Strategies for Electronic Music Producers*.

Frederick, Matthew. *101 Things I Learned in Architecture School.*

Hodgson, Jay. *Understanding Records: A Field Guide to Recording Practice.*

McLuhan, Marshall. *The Medium is the Massage: An Inventory of Effects.*

Warner, Daniel and Christopher Cox. *Audio Culture: Readings in Modern Music.*

Policies

Works Cited

Please cite all external sources you've used for your projects, whether those are recordings, videos, articles, or substantial ideas. It doesn't matter which style of citation you use (MLA, Chicago, APA, etc.) – please make sure to keep it consistent, and make everything as easy as possible to find.

Late Work

Late assignments will have 5% deducted for every 24 hours they are late.

Electronic Device Policy

The precise details will be agreed upon on the first day of class, and the class will adhere to the agreement unless amendments are made. For a general guideline, please refer to the Code of Professional Conduct.

Attendance Policy

Your attendance in class – both the frequency of your attendance as well as the quality of your contributions – comprise your attendance mark, which counts for 20% of your final mark. Travel plans are not an acceptable reason for being absent. Emergencies will be dealt with on a case-by-case basis.

Academic Integrity

In order to maintain a culture of academic integrity, members of the University of

Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. See the UWaterloo Academic Integritity Webpage (https://uwaterloo.ca/academic-integrity/) and the Arts Academic Integrity Office Webpage (http://arts.uwaterloo.ca/current-undergraduates/academic-responsibility) for more information.

Grievance

A student who believes that a decision affecting some aspect of his/her university life has been

unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4 (https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70). When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline

A student is expected to know what constitutes academic integrity to avoid committing academic offenses and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the undergraduate associate dean. For information on categories of offenses and types of penalties, students should refer to Policy 71, Student Discipline (http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm). For typical penalties check

Guidelines for the Assessment of Penalties (http://www.adm.uwaterloo.ca/infosec/ guidelines/penaltyguidelines.htm).

Appeals

A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals (http://www.adm.uwaterloo.ca/infosec/Policies/ policy72.htm).

Note for Students with Disabilities

The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.