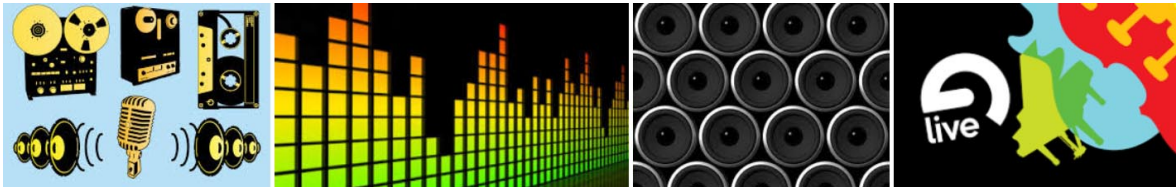




Music Technology Fundamentals



NYU Abu Dhabi
 Music Tech Fund | Fall 2014
 Arts Center C3 112
 Tuesday: 12:45-2:00
 Thursday: 12:45-3:15

Diana Chester, Omar Shoukri
 dc121@nyu.edu, os641@nyu.edu
 C3 109 | t. x84136 | office hours
 Mon/Wed 12:30pm-2:30pm
 and by appointment

CATALOGUE DESCRIPTION

This is an “all-in-one” course for (almost) everything related to music technology. In this course students learn the fundamentals of digital audio, studio and location recording, audio and MIDI sequencing using Logic and Live, music production, and audio programming using Max. This course is the Gateway to the Music Technology disciplinary area courses in the Music Program and it is mandatory for all Music majors. There are no pre-requisites for this course and anyone with an interest in recording and production, sequencing or programming is more than welcome to take it.

This course satisfies the NYUAD Music Program Fundamentals module for Technology, and is cross-listed with interactive media. This course includes a weekend seminar in Istanbul

ORIENTING QUESTIONS

In what ways can we understand musical production and recording cultures, and how do the technologies drive the uniformity of techniques and aesthetic around the globe. How do analog and digital music technologies inform one another, and how does our understanding of basic concepts including how the human ear hears, sin waves, and frequency response, impact our understanding of what sound is and how we can manipulate the things people hear. What is a microphone and how does it really work; why can I plug my headphones into the microphone jack of my computer and record my voice through it? What is sampling and sound synthesis, and do I need to read musical notation to create electronic music? Is

MIDI alive and well? What are the industry standards? How do I record music, and how can I make my original songs sound professional?

COURSE OBJECTIVES

This course will facilitate student learning in developing skills in analog and digital audio, microphone basics and placement, signal processing, the recording studio, digital audio workstations, plug-ins and VST's, MIDI, and location recording. Students will gain an in depth understanding of Logic 7, Ableton Live 8, and Max/MSP, and are encouraged to explore additional music technologies.

This course has three primary objectives: (1) to develop a critical vocabulary for analog and digital audio, including frequency, amplitude, synthesis, and terms related to recording, the music production industry, and software; (2) to gain a beginner level familiarity with recording techniques, equipment, and software; (3) to use this understanding in the development of aural and musical recordings and performance pieces.

LEARNING OUTCOMES

- Digital audio theory and analog-to-digital and digital-to-analog conversion
- Types of microphones and microphone placement in recording
- Mixing consoles, speakers, effects processors, DAWs and studio signal flow
- Setting up a basic studio recording session
- Basics of location recording, boom operation and portable recorders
- Sequencing audio and MIDI using Logic and Live
- Mixing Fundamentals
- Introduction to audio programming using Max

HOMEWORK AND IN-CLASS TESTS

There are seven homework assignments during the semester that will correspond to each of the covered topics. There are also three in-class evaluations that will assess the theoretical knowledge that has been acquired during the semester.

GRADING (based on rubric below)

Individual preparation and participation

In-class discussion & Lab participation: 10%

Individual projects

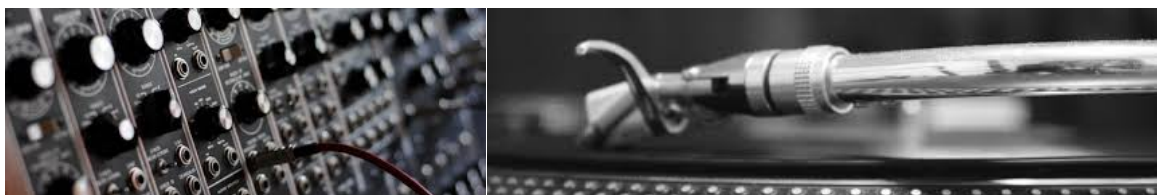
Homework assignments: 50%

Exams

In-class tests: 35%

Attendance

Event Attendance: 5% (see policy below)



BOOKS AND OTHER READINGS

John Margulies, *Ableton Live 9 Power: The comprehensive guide*
(Cengage Learning PTR, 2013)

David Moulton, *Total recording The Complete Guide to Audio Production and Engineering.*
(KIK Productions, 2001)

David Nahmani, *Apple Pro Training Series: Logic Pro X: Professional Audio Production.*
(Peachpit Press, 2014)

Booby Owsinski, *The recording engineer's handbook (3rd ed.)*
(Cengage Learning PTR, 2013)

Mike Senior, *Mixing secrets for the small studio.*
(Focal Press, 2011)

Rick Viers, *The location sound bible: How to record professional dialog for film and TV.*
(Michael Wiese Productions, 2012)

Texts are available at the NYUAD Bookstore (t. 02 6590778) and are available on reserve at the NYUAD Library.

ASSIGNMENTS

Written and project based assignments should be brought to class the day are due and air dropped to the teacher computer in 112. Late assignments will be reduced by a partial letter grade (+/-) for each class that they are late. If assignments are more than one week late you must make an appointment to speak to us about the project and the reason for the late submission.

ABSENCE POLICY

If you will be absent from class due to religious observance or participation, an art performance, or a cultural trip, please notify us at least one week in advance. If you are absent from class for medical reasons, please provide a note from your doctor.

Missing a class does not excuse you from respecting assignment deadlines.

Unexcused absences are not acceptable, except in extraordinary circumstances, and will negatively impact your final grade for the class. As per the NYUAD policy after three unexcused absences you will be asked to withdraw from the course.

ACADEMIC HONESTY AND PLAGIARISM

Plagiarism will result in an F on an assignment. Repeated plagiarism will result in an F for the course. Please be aware of NYUAD's policies on academic honesty and plagiarism.

<https://nyuad.nyu.edu/students/campus.life/policies/policy.academic.integrity.html>

ADDITIONAL INFORMATION

If you have questions about anything related to the course, I am available after class, or you may contact me by email or telephone. Should you be unable to make office hours, schedule an appointment for another time. Please let me know if you have any questions or require any special consideration.

COURSE OUTLINE

01 – THE RECORDING STUDIO I: INTRO TO STUDIO AND ANALOG SIGNAL FLOW

- 02 Sep Introduction to the class and Introductions
Lecture: Introductions and Class Overview. Theory of Digital Audio. Students will learn recording basics on the Lab computers.
- Homework Assignment 1:** Record and export a vocal track into Logic using any microphone.
- 04 Sep Lab: Introduction and Overview to room 140, analog signal flow.
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02— MICROPHONES

- 09 Sep Lecture: Microphones: This class will provide an overview of microphones from live sound to recorded environments. Students will learn how to use and understand microphones and what type of microphones to use for different recording scenarios.
- Homework Assignment 2: Use a Condenser microphone to record a 1-2 minute vocal composition in mix/edit room 140. Partner with a classmate, to learn the ins and outs of your condenser microphone.
- 11 Sep Lab: We will learn how to use and setup microphones for a recording session and practice recording them in the classroom environment.
- Homework Assignment 1 Due**
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03— SIGNAL PROCESSING I

- 16 Sep Lecture: Introduction to Signal Processing, EQ and Filters. Overview of filter types including low pass, high pass, as well as shelving and parametric in the analog and digital domain.
- 18 Sep Lab: Students will work hands on with analog EQ and Filters to understand the workflow of using these in an analog realm. Intro to DBX EQ and Korg monochrome ribbon synthesizer. Logic EQ tech. Review homework assignment and listen and critique recordings.
- Homework Assignment 2 Due**
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04— THE RECORDING STUDIO II: CONSOLES, AUDIO INTERFACES, AND SPEAKERS

- 23 Sep Lecture: Expose students to the basics of other studio equipment they will encounter including mixing consoles, digital audio interfaces, speakers, DI's and headphones. Discuss frequency response and playback, input

and output controls, and general analog-digital audio technique, AD converters, signal-noise ratio, gain structure, etc.

25 Sep

Lab: In-class test I

Digital audio basics and studio equipment (30min)

As a class we will learn how to mic a drum kit and record the session.

Homework Assignment 3: You will be provided with an instrumental track. You are to record a vocal or instrumental track to accompany the main track.

05— SIGNAL PROCESSING II

30 Sep

Lecture: A more in depth overview of external effects processors, and their correlation with logic plug-ins. These will include dynamics, distortion, delay, reverb, modulation, and pitch.

02 Oct

Lab: Critique of homework assignment. Students will utilize their homework recordings, along with Logic Plug-ins to create their first mix down.

Homework Assignment 3 Due

Homework Assignment 4: Create a four-channel studio recording, and export the stems.

NO CLASS EID BREAK

06— SIGNAL FLOW I: AN INTRODUCTION TO MIXING IN THE ANALOG DOMAIN

14 Oct

Lecture: Students will learn how to create auxiliary and headphone mixes. Students will learn how and when to use their auxiliary effects, how to connect them to their consoles and interfaces.

16 Oct

Lab: Students will utilize an analog mixer and learn how to effectively use aux's, sends, and busses.

07— ABLETON LIVE I: AN INTRODUCTION

21 Oct

Lecture: This will provide an overview of Ableton Live as a tool for recording, and performance.

23 Oct

Lab: Critique of homework assignment. Students will import and record their own tracks utilizing Ableton's sounds and plugins.

Homework Assignment 4 Due

Homework Assignment 5: Use stems from Homework Assignment 5 to compose and remix a performative piece in Ableton Live.

08— ABLETON LIVE II: PERFORMING AND ARRANGING

- 28 Oct Lecture: This class will provide an overview of using Ableton Live as a platform for sequencing, arranging and automating.
- 30 Oct Lab: **In-Class Performances** Students will have 15 minutes each to perform their Ableton compositions and explain their process.

Homework Assignment 5 Due

09— SIGNAL FLOW II: MIXING IN THE DIGITAL DOMAIN

- 04 Nov Lecture: Signal flow in the digital domain. Using your DAW's mixing environment.
- 06 Nov Lab: Critique Homework Assignment. This lab will focus on the logic mixer, and how to create a good virtual mix-down environment.

10— MIDI: INTRODUCTION TO MIDI IN THE ANALOG AND DIGITAL DOMAIN

- 11 Nov Lecture: Introduction to real and virtual MIDI synths, what are they and how do they work?
- 13 Nov Lab: Students will have the opportunity to program sounds on real and virtual synthesizers including the MicroKorg, Moog Slim Phatty, and Native Instruments Komplete. Students will learn how to use Re-Wire and VST's in their session files. This lab will involve a high level of experimentation.

TRIP TO ISTANBUL RECORDING STUDIO

11— LOCATION RECORDING I

- 18 Nov Lecture: Basics of location recording: We will discuss fundamental techniques of location sound recording, including microphone and gear selection, interview technique, and common challenges.
- 20 Nov Lab: This lab will provide a technical overview of field recording devices and tools including the Zoom H4n, and Sound Devices Field recorders, as well as some important techniques for successfully recording in the field. Students will be asked to record things outdoors and to work in groups.
Homework Assignment 6: Sonic Storyboarding: Create a narrative sound composition from a collection of field recordings from at least one location, or multiple locations. Ideally your piece will not exceed 3 minutes, and your listener should be able to understand the plot. Your session file should be a minimum of six tracks.

12— LOCATION RECORDING II

- 25 Nov Lecture: This class will explore the way location sound is used in storytelling and developing a narrative plot. We will look at examples of produced music and sound for film, exploring Foley, and popular recorded albums.
- 27 Nov Lab: **In-Class Presentations** Students present their sonic storyboards to their classmates and teachers, and provide a technical overview of their process. Each student will have 15 minutes to present.

Homework Assignment 6 Due

13— BASICS OF MAX I

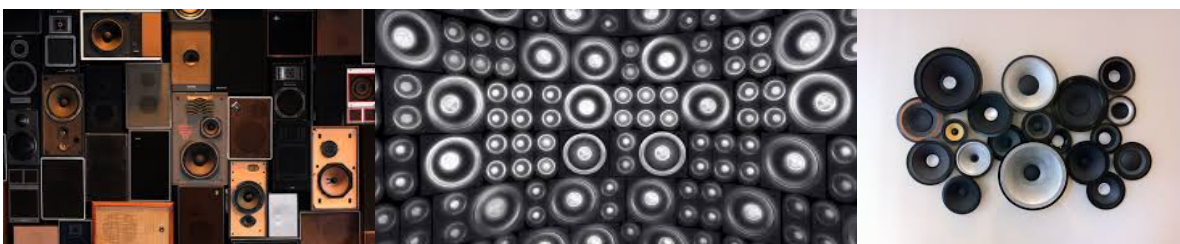
- 02 Dec Lecture: This class will look at visual programming environments, their history, the development of cycling 74, and look at a variety of sound and video based examples of projects that rely on Max for their built environment.
- 04 Dec Lab: Introduction to the Max Programming environment, with an overview of how to create objects, and build basic patches. We will look at the tutorials Max offers, and through them unpack the basics of visual programming and presentation design.

Homework Assignment 7: Based on what we covered in class, develop a very basic idea for a max patch, and write out the steps to how you think you might do it and what steps would be important to include.

14— BASICS OF MAX II

- 02 Dec Lecture: This class will cover the basics of audio manipulation in Max. Examples will be show to highlight the types of possibilities that exist for audio manipulation, students will have an opportunity to play around with patches created by sound artists, and will begin to build a basic patch where they can recall and manipulate audio files.
- 04 Dec Lab: **Final in class test** — Questions addressing all topics covered during the semester.

Homework Assignment 7 Due



GRADING RUBRIC

Excellent (10)

Student demonstrates a command over key technical and theoretical concepts and can successfully apply this knowledge to the course subject matter with accurate description and detail.

Very Good (9)

Student demonstrates an understanding of key technical and theoretical concepts and is able to apply this in their presentation of the course subject material with coarse detail.

Good (8)

Student demonstrates an understanding of most technical and theoretical concepts. Student can identify technical information they have been taught in context and struggle to apply this information to new scenarios.

Fair (7)

Student demonstrates an understanding of some technical and theoretical concepts related to the course subject matter. S/he is able to identify key components of these concepts while struggling to understand the concept completely.

Poor (6)

Student demonstrates a poor understanding of technical and theoretical concepts related to the course subject matter but is able to identify a rudimentary understanding of some of the material.

No Credit (5 and Below)

Student struggles to recall most technical and theoretical concepts related to the course subject matter and is unable to demonstrate their understanding of this material.

EVENT ATTENDANCE POLICY

In addition to coursework, an essential component of your educational experience at NYUAD are the number of events organized by the Music Program, which are contributing substantially to increasing the musical life of NYUAD and Abu Dhabi. These events include the NYUAD Music Program Lecture Series as well as other concerts and events. If you take a course offered by the Music Program you are required to attend a minimum of two Music Program sponsored events per semester. This requirement will constitute 5% of your grade to the following classes in 2014-2015:

