Official 158A Course Description

*Explores the intersection of music and computers using a combination of scientific, technological, and artistic methodologies. Musical concerns within a computational frame are addressed through the acquisition of basic programming skills for the creation and control of digital sound. Will learn core concepts and techniques of computer based music composition using the Cycling74/MaxMSP programming environment in combination with associated software tools and programming approaches created by the Center for New Music and Audio Technologies. Included will be exposure to the essentials of digital audio signal processing, musical acoustics and psychoacoustics, sound analysis and synthesis. The course is hands-on and taught from the computer lab.*

MUSIC 158A RUBRIC

Music 158A explores music making and the study of music within a computational frame that requires knowing about digital sound as well as related software programming concepts and practicals. We use Max/MSP as the baseline platform, but we focus on CNMAT materials and pedagogy rather than generic Max training. The central goal is to teach how computers/computation can provide frameworks/workspaces for the study and creation of music.

The course maintains a notion of music discipline while at the same time leverages working, teaching, and thinking outside the typical music situated silos. Students that take the course should gain a broad understanding of the essential relationship of music and technology that will include core programming skills and practices alongside a deeper understanding and reframing of basic musical topics. This process involves the acquisition of technical models of thinking, including acquisition of programming skills, as well as in-depth exploration and explanation of musical concepts related to time, frequency, and form. Every activity in the class should know itself as both contributing to the skill acquisition ladder (Odot, CNMAT objects, core musical topics), as well as augmenting and challenging the student in terms of how music can be defined and studied within a computational frame.

What is music with a computational frame of mind?

How do computers enhance and enable the understanding of music?

Music 158A is the gateway course for all students (undergraduate and graduate) who want to pursue work at CNMAT.

Music 158A is also the gateway to Music 158B, where students will be expected to have accomplished a full music orientation as well as baseline ability to program using CNMAT pedagogy and tools -- Odot, CNMAT objects, Depot softwares. Music 158B situates the knowledge gained in Music 158A inside the tangible user interface and instrument building paradigms.

MUSIC 158A TEACHING APPROACHES

Class is lab-based and depends on students using Max/MSP in classroom as the primary vehicle for learning.

Focus should be on active learning strategies where students are given specific challenges designed to clarify musical and technical challenges but also inspire student with solid demonstrations of what is possible with limited knowledge.

Lecture in classroom should be minimal. Present the overall paradigm problem and then allow the computer-based pedagogical materials to guide the student through a series of exercises. Then, in follow up demonstrate solutions and show solid musical outcomes.

A single semester cannot present everything, so individual instructors should customize their own version of the course to best match their personal expertise. The core course material modules should be designed in such a way to facilitate additions, modifications or extractions of key materials.

Teaching modules should be more than just pedagogy, they should also provide plunderable solutions to basic problems. They should link to “further” resources and training. The latter case takes care of better prepared and faster moving students who want to travel farther.

ROUGH TOPICS FOR COURSE MODULES

Max/MSP bootcamp

Basics of digital audio signal, DSP

Synthesis (frequency)

additive (CNMAT spectral objects)

subtractive (?)

signal processing and transormations

Sampling

buffers/windowing, time-based operations, granularity

Spatial Audio

Stereo field

multi-channel audio

Shaping Control: constraints, and parameter spaces

control through analysis

control through probability

control through real-time input/interface

data mapping

Functional:

Introduce Max/MSP

Introduce CNMAT tools (odot, CNMAT externals, Depot)

Introduce CNMAT pedagogy for music and computation

COURSE LOGISTICS AND MATERIALS MANAGEMENT/PREPARATION/UPGRAGE

Core development and management of course materials will be stored and managed in CNMAT GitHub. CNMAT/CNMAT-Pedagogy.

Actual course materials for delivery in class will happen through Bcourse and arrangement with Lab staff. Ed will permanently be instructor/owner for the Bcourse site for Music 158A.

Goalsl:

Ability to pass on the course to future graduate student instructors.

Transition pedagogy materials to a modular design whereby course components can be mixed and matched and augmented or diminished to best meet the skills and interests of the instructor.

Create modules in such a way that allow for growth and linking to other existing materials and activities.