

DC 337-401  
Max Cycling 74 Workshop

Fall 2018  
Wednesday 1:30pm-3:00pm  
CDM Room 526

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Office Hours: Wednesday 3:00pm-3:45pm

This course is a workshop style introduction to the object-oriented programming language Max, that is used by musicians, designers, filmmakers, and visual artists to create works of Interactive Media. The course will introduce the basics of programming in the Max environment and cover sound synthesis, sample playback, music instrument design, and audio-reactive animation.

Max is a powerful platform that accommodates and connects a wide variety of tools for sound, graphics, music and interactivity using a flexible patching and programming environment. Max allows most computer users to write a simple, meaningful program within a few minutes, even with limited programming knowledge. But to do something more substantial it's necessary to approach Max as an actual programming language, by taking advantage of its various mechanisms for abstracting program elements into scalable, reusable components that can be combined in increasingly powerful ways.

This class will not cover every single capability of the language, but instead will focus on key concepts and mechanisms that will allow for tremendous new freedom and possibilities in Max.

#### COURSE OVERVIEW

##### WEEK 1

Introductions

Class Overview

Overview / quick History of Max/MSP, IRCAM, etc.

A Brief Tour of Max – overview of basic components

##### WEEK 2

Visual Programming in Max – Basics

Objects and Patchcords

The Patch / the Max Window

Basic editing / interface issues: The Hello patch

Messages types: The Bang message, Numbers, Lists

Basic User Interface Objects: Button, Toggle, number box

Ordering of messages

Creating basic timing: the metro object

##### WEEK 3

More Max Basics

Solutions: the trigger object.

Doing Math / problems with using two inlets

Solutions: the bondo object  
More user interfaces: Sliders and Dials  
An introduction to data input objects: rslider, Pictslider, Radiogroup, menus  
Doing complicated expressions (regular expressions) – expr  
Looping and iteration: the counter object!!!  
Getting basic input: the key and mousedown objects

#### WEEK 4

Interfacing  
MIDI – history / ideas  
Anatomy of a MIDI message  
MIDI hardware setup  
Getting MIDI message in/out of Max – using the built in synth  
Generating and managing Note events  
Controller messages  
Parsing MIDI  
Sequencing

#### WEEK 5

Encapsulation  
Creating patchers (Download encapsulation files)  
The abstraction  
Including arguments  
Structurally how to use encapsulation  
Inline patchers: bpatcher  
Building your own library of objects  
Using send/receive  
pattr – state control and storage within encapsulated patches  
Using route with lists  
Gates and switches – revisited

#### WEEK 6

MSP Basics  
Basics of Digital audio A/D and D/A object – Audio DSP settings – Audio patch cords  
The cycle~ object  
The multiply (\*~) and its effect on signals  
The gain~ object  
Routing and switching signals

#### WEEK 7

Basic Audio Playback and control  
Using buffer~ and groove~  
The waveform~ object  
Ideas for sample playback control interfaces  
Storing audio into buffers  
Graphic display of buffer contents  
The groove~ object  
Scrubbing, looping, and other sample playback techniques

## WEEK 8

Introduction to Synthesis Techniques

Control vs Audio signals

Cycle~ and line~ revisited

Controlling amplitude envelopes, and other functions through time.

Generating noise~

Additive synthesis

Wavetable synthesis

## WEEK 9

Recording and Processing Live Audio

Using the record~ object

Filtering – quad~, filtgraph~ and other filtering options

## WEEK 10

Final Project Review

## NOTE

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be addressed during class and posted under announcements in D2L.

## GRADING

You will be evaluated on your participation in class discussions and activities, the completion of weekly assignments, and on the final project..

Class participation: 30% Assignments: 30% Final Project: 40%

Given the swift nature of the quarter, you are allowed one absence, excused or not, after which your grade will drop by one full letter per absence. You are responsible for keeping up with what takes place during any missed classes. I strongly encourage you to communicate with me in advance about any foreseen absences or tardiness, so that we can work out a plan to keep things on track.

## DUE DATES & LATE ASSIGNMENTS

Assignments are due at the start of class on the day they are due. Any time after that the assignment will be counted as late. If you are absent, you must email me the link or file by the due date and time.

## COURSE MATERIALS

There are no textbooks or other required materials for this class. However, you are encouraged to obtain a method for backing up and transporting your data – typically a USB drive.

## ONLINE TEACHING EVALUATIONS

Instructor and course evaluations provide valuable feedback that can improve teaching and learning. The greater the level of participation, the more useful the results. As students, you are in the unique position to view the instructor over time. Your comments about what works and what doesn't can help faculty build on the elements of the course that are strong and improve those that are weak. Isolated comments from students and instructors' peers may also be helpful, but evaluation results based on high response

rates may be statistically reliable. As you experience this course and material, think about how your learning is impacted.

Your honest opinions about your experience in and commitment to the course and your learning may help improve some components of the course for the next group of students. Positive comments also show the department chairs and college deans the commitment of instructors to the university and teaching evaluation results are one component used in annual performance reviews (including salary raises and promotion/tenure). The evaluation of the instructor and course provides you an opportunity to make your voice heard on an important issue – the quality of teaching at DePaul. Don't miss this opportunity to provide feedback!

#### ACADEMIC INTEGRITY

DePaul University is a learning community that fosters the pursuit of knowledge and the transmission of ideas within a context that emphasizes a sense of responsibility for oneself, for others and for society at large. Violations of academic integrity, in any of their forms, are, therefore, detrimental to the values of DePaul, to the students' own development as responsible members of society, and to the pursuit of knowledge and the transmission of ideas. Violations include but are not limited to the following categories: cheating; plagiarism; fabrication; falsification or sabotage of research data; destruction or misuse of the university's academic resources; alteration or falsification of academic records; and academic misconduct. Conduct that is punishable under the Academic Integrity Policy could result in additional disciplinary actions by other university officials and possible civil or criminal prosecution. Please refer to your Student Handbook or visit Academic Integrity at DePaul University (<http://academicintegrity.depaul.edu>) for further details.

#### STUDENT SUCCESS

Your success is our number one priority at DePaul University. University resources to help you succeed include computer labs, free or discounted software, tutoring centers, health services, and services for designated groups, such as veterans and students with disabilities. Visit [go.depaul.edu/success](http://go.depaul.edu/success) to learn more.

Students seeking disability-related accommodations are required to register with DePaul's Center for Students with Disabilities (CSD) enabling you to access accommodations and support services to assist your success. There are two office locations:

Loop Campus – Lewis Center #1420 – (312) 362-8002

Lincoln Park Campus – Student Center #370 – (773) 325-1677

Students who are registered with the Center for Students with Disabilities are also invited to contact me privately to discuss how I may assist in facilitating the accommodations you will use in this course. This is best done early in the term. Our conversation will remain confidential to the extent possible.