

# Introduction to Digital Media & Computer Music: Visual Programming with Max

- MUCO 592 | Fall 2020 -

Wednesday 2-3:50pm Pacific | Zoom

Syllabus Link: <https://docs.google.com/document/d/1v5xGpbpCHiPEwGbp10o7g3UvSKnUf2ve-gxHbjFV8/edit?usp=sharing>

## Instructor:

Dr. Nina C. Young

Office Hours: Fridays 9:30 - 10:45am Pacific, or by appointment with scheduling conflict

<https://usc.zoom.us/j/97384528432>

Zoom Meeting ID: 973 8452 8432

Email: [ninayoun@usc.edu](mailto:ninayoun@usc.edu)

Pronouns: she/her

## Zoom Info:

Wednesday 2-3:50pm Pacific

<https://usc.zoom.us/j/98983143759?pwd=NGRWZnNGbjMrdjMxLzZiazVMUVFIUT09>

Meeting ID: 989 8314 3759

Passcode: cycling74

## Course Description:

This seminar (the 1st of a 2-semester sequence geared towards composers and musicians as well as students with an interest in programming and some musical background) investigates the computer as a tool for generative and interactive music applications and enables the creation of multimedia interactive performance, composition, and improvisation environments. Students will learn the visual programming environment Max (formerly known as Max/MSP, developed by Cycling '74) supplemented with other computer/electronic music tools to implement creative projects. Basic familiarity with digital audio and DAWs recommended, previous programming experience not required.

This course is divided into four areas:

1. **Building Blocks:** the fundamentals of Max
2. **MIDI:** basics of MIDI protocol, sequencing, algorithms, external controllers
3. **Signal Processing:** digital signal processing, filters, buffers, and real-time treatments
4. **Structural Applications:** patch architecture, externals, data storage

Weekly programming assignments solidify concepts covered in class, and are geared towards larger midterm and final projects.

## Course Objectives:

- Learn how to program in Max/MSP to create music, audio, and video applications. Max is a huge and complex program, with hundreds of specialized routines and custom interfaces. In this class we will barely scratch the surface of what can be done with it. At its heart, Max is no different than any other higher-level programming language. Yet it is easy to do basic things, and there are lots of shortcuts and read-to-use examples in the language, help-files, and tutorials to aid in your learning curve. If you really want to master Max, it takes patience, discipline, hard work, and lots of practice - just like learning to play an instrument!
- Use Max/MSP to study audio synthesis and processing algorithms.
- Implement examples of algorithmic and generative composition.
- Write an original piece of interactive computer music (or design a performance environment, or other approved final project) using primarily MaxMSP.
- Become aware of repertoire, including contemporary and historic works of interactive composition and performance.

## Materials:

- We will be
- A licensed copy of Max8 on a personal computer. Available at <https://cycling74.com>
  - Start with the 30 day trial <https://cycling74.com/downloads>
  - After 30 days, purchase an academic license <https://cycling74.com/shop>
    - \$250: Max Academic Permanent License (with \$99 upgrades to future versions) - recommended
    - \$59: Max Academic Annual Subscription
- All other software is optional and should be purchased at the discretion of the student. Note: some of the supplemental tools I will demo in class are only available on Mac OS. This does not mean that there aren't PC equivalents available.
- Additional readings / listening: available for download or from the library.

## Supplemental Materials:

- DAW (Digital Audio Workstation) such as Logic Pro, Cubase, ProTools, Ableton, etc
  - Free: Ardour, Audacity
- Cipriani, Alessandro & Maurizio Giri: *Electronic Music and Sound Design - Theory and Practice with Max 8*
- Manzo, V.J. *Max/MSP/Jitter for Music: A Practical Guide to Developing Interactive Music Systems for Education and More*
- Roads, Curtis: *The Computer Music Tutorial* (Cambridge: MIT Press, 1996)
- Taylor, Gregory: *Step by Step - Adventures in Sequencing with Max/MSP* (Cycling 74, 2018)
- MIDI controller, audio interface, microphone(s).

- Stanford's Kadenze Class: *Programming Max - Structuring Interactive Software for Digital Arts* (designed and taught by Professor Matt Wright)  
<https://www.kadenze.com/courses/programming-max-structuring-interactive-software-for-digital-arts/info>

## Assessment Measures:

Programming and HW Assignments (assigned weekly)	50%
Midterm Project	10%
Curated Listening List Project	10%
Final Composition Project	25%
Class Participation	05%

Blackboard will be used to communicate all course information including calendar updates, lecture notes, example patches, listenings, readings, and assignment prompts. All assignments must be submitted on Blackboard unless otherwise noted. Students must come to class with assignments on their computers and be prepared to present them in class, using screen sharing.

Programming and HW Assignments will be posted at the end of every week. Students are responsible for checking Blackboard for updates, prompts, and deadlines.

The **Midterm Project** is a guided programming project due on **October 6th 11:59pm Pacific** with videos of documented performances. These will be discussed and presented in class on October 7th. Details forthcoming.

For the **Curated Listening List Project** due on **October 23 11:59pm Pacific** you will create a listening guide of 7-12 pieces, performances, installations, etc. that use MaxMSP or live/interactive electronics that are of interest (to you). This project will contain A/V files (links to streaming services, legal downloads, or a zipfolder) and an accompanying text that guides the listening experience (think blog post, pitch fork review, etc.). You may format this as a shareable Google Doc or Website that will be accessible to everyone in the class. The text should comment on historical information, personal opinions about the music, and comments about its composition and production techniques. (Minimum of 1 paragraph per piece). All pieces must be listed with bibliographic information (composer, performers, title, date, label - if applicable, etc.). Make sure that your list contains a diverse set of artists and projects. Consider using a more playful, journalistic language, allowing you to share this as a resource both inside and outside of your immediate communities.

**Final Projects** will be submitted as documented performances, with accompanying materials on **November 17th at 11:59pm Pacific**. These materials (audio-visual, details forthcoming) should be refined and will be included in a video premiere concert streamed on Youtube and Facebook Live (aired date TBD) in which you will all participate. These projects will optionally be considered for inclusion on USC's digital concert stage.

## Course Calendar

All instructions, assignments, readings, and essential information will be on the Blackboard website. Check this site regularly to stay updated on the course schedule.

### **Class Schedule and Topics**

\*Subject to Change, Please check back often for schedule updates.

**Class 01: 08.19.2020:** Intro to class. What is 'interactive electronics'? What is Max? Installing and navigating Max. Help files, resources, tutorials.

**Class 02: 08.26.2020:** Max data types. Printing. Numbers and and Max.

**Class 03: 09.02.2020:** More arithmetic. Logic Functions. Gates and Switches.

**Class 04: 09.09.2020:** First look at generative music. Random generators. What is MIDI? Controllers. Data storage, messages, table, coll.

**Class 05: 09.16.2020:** More MIDI. Timing (metro, tempo, transport). Midi sequencing (seq). Multislider. MC objects.

**Class 06: 09.23.2020:** List Processing - Sorting lists (zl). Probability (prob, histo, anal, mean).

**Class 07: 09.30.2020:** Routing and Data Storage.

**Class 08: 10.07.2020:** *\*\*Midterm Projects Due\*\**. Intro to MSP - Digital Audio and Signal Processing. Simple oscillators and waveforms, sound file playback.

**Class 09: 10.14.2020:** Buffers and samplers.

**Class 10: 10.21.2020:** Intro to Synthesis Techniques (additive, subtractive, AM, FM)

**Class 11: 10.28.2020:** All things Delay. Filters and EQ.

**Class 12: 11.04.2020:** Creating external processing modules using other 3rd party externals and Max for Live Objects (AMXD~), with messages, pattr storage, #1, #0, etc.. More advanced routing and data storage. Package Manager. Filepath systems and organizing your patches.

**Class 13: 11.11.2020:** Performance Patch Architecture and Organization. Inputs, Outputs, Routing, Cueing, and Events.

## **Assignments:**

Check Blackboard frequently for assignment postings, instructions, and deadlines. Note: all due date times are listed in Pacific.

**Weekly Programming Assignments (10):** Due the following class week, Wednesday at 12pm.

**MIDTERM PROJECT:** Duet for one keyboardist. Due 10/06 11:59pm.

**Curated Listening List Project.** Due 10/23, 11:59pm.

**Final Project Materials and Documentation.** Due 11/17, 11:59pm.

**Final Project Presentation / Live-Stream Class Concert.** TBD.

## **Course Policies:**

### Classroom expectations:

All students are expected to participate in class discussions, and are expected to respect the opinions and statements of their classmates during discussions and classroom activities.

**The course patches will be available 15-minutes prior to the start of class. Please download them and have them ready on your machine.**

### Attendance and Zoom etiquette:

Since I do not rely on a single textbook, but instead draw from various sources (some of which are unpublished) and rely on in-class creations, it is essential that you attend class regularly. Excessive absences will be noted and will affect your final grade, both directly (class participation grade) and indirectly (you won't know what you're doing in the assignments and projects). This is a fun class, show up, learn stuff, and you'll do just fine!

We will be using Zoom for all of our classwork. I expect you to demonstrate your presence and participation by your being on camera in all Zoom sessions. If you will be unable to keep your camera on during the Zoom session, please contact me prior to the class session to discuss exceptions, otherwise you will be marked down for participation.

Please make sure your Zoom system is enabled for stereo Zoom

## Synchronous session recording notice

As required by USC, the synchronous sessions for classes will be recorded and provided to all students asynchronously. This is a useful way to review the materials in class, however, I will emphasize that you will get a better learning experience if you are present in the Zoom sessions to directly ask questions.

## Sharing of course materials outside of the learning environment

USC has a policy that prohibits sharing of any synchronous and asynchronous course content outside of the learning environment. Please do not share or otherwise distribute class materials, music scores or recordings produced by me or any students in the conduct of this course without expressed permission.

*SCampus Section 11.12(B)*

*Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes, but is not limited to, providing materials for distribution by services publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy).*

## USC technology rental program

We realize that attending classes online and completing coursework remotely requires access to technology that not all students possess. If you need resources to successfully participate in your classes, such as a laptop or internet hotspot, you may be eligible for the university's equipment rental program or other assistance. To apply, please [submit an application](#) on the Student Basic Needs portal.

## USC Technology Support Links

[Zoom information for students](#)

[Blackboard help for students](#)

[Software available to USC Campus](#)

## Assignments:

All assignments must be submitted via Blackboard by the due date and time specified. PLEASE FOLLOW ALL ASSIGNMENT INSTRUCTIONS, including participation and forum prompts. Any sounds, abstractions, plugins, or other external files must be included in your submission. If something is missing, you will be notified and given the opportunity to resubmit, but with a late penalty. All grades are considered final and non-negotiable.

## Late Assignments:

This is a graduate seminar. Treat the class with respect and do your work. Late assignment submission will be reflected in your grade. Just do the work, even if it isn't perfect - you will learn something! Despite the word "programming" - this is art, and you are expanding your compositional toolkit. Make mistakes, this is how you expand. Yay!

Final Projects and Midterms deadlines are non-negotiable.

## Student Rights and Responsibilities:

- You have a right to a learning environment that supports mental and physical wellness. You have a right to respect.
- You have a right to be assessed and graded fairly.
- You have a right to freedom of opinion and expression.
- You have a right to privacy and confidentiality.
- You have a right to meaningful and equal participation, to self-organize groups to improve your learning environment.
- You have a right to learn in an environment that is welcoming to all people. No student shall be isolated, excluded or diminished in any way.

## With these rights come responsibilities:

- You are responsible for taking care of yourself, managing your time, and communicating with the teaching team and with others if things start to feel out of control or overwhelming.
- You are responsible for acting in a way that is worthy of respect and always respectful of others.
- Your experience with this course is directly related to the quality of the energy that you bring to it, and your energy shapes the quality of your peers' experiences.
- You are responsible for creating an inclusive environment and for speaking up when someone is excluded.
- You are responsible for holding yourself accountable to these standards, holding each other to these standards, and holding the teaching team accountable as well.

## Personal Pronoun Preference and Names:

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by a name different than what appears on the roster, and by the gender pronouns you use. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

## Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b).

Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity <http://equity.usc.edu> or to the Department of Public Safety <http://adminopsnet.usc.edu/department/department-public-safety>. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage <http://sarc.usc.edu> describes reporting options and other resources.

## Support Systems

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*

[studenthealth.usc.edu/counseling](http://studenthealth.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1(800) 273-8255 – 24/7 on call*

[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call*

[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX - (213) 821-8298*

[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*

[usc-advocate.symplicity.com/care\\_report](http://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.



*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](http://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Campus Support and Intervention - (213) 821-4710*

[campussupport.usc.edu](http://campussupport.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 - 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 - 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.