Instrument, Installation, Interface: Building Sound

Computer Music Center - Department of Music

MUSI 6631 GR sec:001

Meeting Times:	Mondays 4:10 pm - 6:00 pm
Classroom Location:	Online & Hybrid at Prentis 324/320h
Instructor:	Dr. Seth Cluett
Contact Info:	sc4340@columbia.edu; ext. 4-9266
Office Hours:	https://calendly.com/sethcluett/office-hours

COURSE DESCRIPTION

This course will address hands-on making through creative projects reinforced with critical and historical readings to contextualize work. Coursework will explore fabrication, gears and motors, homemade instruments, 3d printing, amplifiers and transducers, circuit bending, and getting comfortable soldering and reading circuits. The course engages creative uses of audio technology within and beyond the concert hall, instrumental acoustics and organology, and movement, gesture, and space as elements of structuring sound work. Fluency, trouble-shooting, and self-reliance regarding basic audio hardware, signal flow, and technical requirements for supporting the addition of amplification, fixed media, or interactive electronics to sound work will be a focus throughout. We'll explore instrument building and modification, installation design and construction, and physical interfaces to software instruments through hands-on projects supported by readings and repertoire and will culminate in a creative project of your own design.

COURSE OUTCOMES

- 1) Understand the critical and historical precedents for creative work with electro-acoustic, electro-mechanical, mechanical, and electronic instrument, installation, and interface design.
- 2) Understand how to integrate these devices into composition, performance, and artistic practice.
- 3) Understand what is available, possible, and practicable for the construction, fabrication, and performance or display of physical objects related to creative work
- 4) Ability to confidently source parts, identify resources, and assess needs for projects involving the physical design of objects, instruments, interfaces, sculpture, and installation.
- 5) Be able to read basic schematics to build functional circuits for sound making and interactivity

FORMAT AND STRUCTURE

This course will use technical training in parallel with historical and conceptual readings to foster the development of creative work, as such class time will flow freely between software/hardware introductions, structured discussion, and the consumption of media/art/music that frames or contextualize our work.

COURSE MATERIALS

Recommended Textbook:

Handmade Electronic Music: The Art of Hardware Hacking 2nd Edition, Nicolas Collins

Other Readings: Consult Canvas class resources page for regularly updated list of readings/resources

Materials: Laptop computer with Max 8 ($60/academic year), headphones, notebook, a slack account.

COURSE REQUIREMENTS

ATTENDANCE

Attendance is required.

Participation

Student participation (both in-class and online as appropriate) is required. Participation includes: presenting your creative work in an informative and compelling manner; giving thoughtful, constructive feedback on the presentations of your colleagues; and asking clarifying questions or sharing points of curiosity during skill-building lectures. Participation will be worth 15% of your grade. If there is any situation or dynamic in class that is inhibiting a student from participating fully and happily, the professor should be notified as soon as possible.

ACADEMIC INTEGRITY

Columbia's intellectual community relies on academic integrity and responsibility as the cornerstone of its work. Graduate students are expected to exhibit the highest level of personal and academic honesty as they engage in scholarly discourse and research. In practical terms, you must be responsible for the full and accurate attribution of the ideas of others in all of your research papers and projects; you must be honest when taking your examinations; you must always submit your own work and not that of another student, scholar, or internet source. Graduate students are responsible for knowing and correctly utilizing referencing and bibliographical guidelines. When in doubt, consult your professor. Citation and plagiarism-prevention resources can be found at the GSAS page on Academic Integrity and Responsible Conduct of Research.

Failure to observe these rules of conduct will have serious academic consequences, up to and including dismissal from the university. If a faculty member suspects a breach of academic honesty, appropriate investigative and disciplinary action will be taken following Dean's Discipline procedures.

LEARNING ACCOMMODATIONS

If you have been certified by Disability Services (DS) to receive accommodations, please either bring your accommodation letter from DS to my office hours to confirm your accommodation needs, or ask your liaison in GSAS to consult with your professor. If you believe that you may have a disability that requires accommodation, please contact Disability Services at 212-854-2388 or disability@columbia.edu.

Important: To request and receive an accommodation you must be certified by DS.

INCLUSIVITY

Name and Pronoun Usage

As this course includes group work and in-class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform the instructor of the necessary changes.

Inclusion Statement

It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally, or for other students or student groups.

CRITERIA FOR EVALUATION

Participation in class discussion and critiques, thoughtfulness about your process for making work, and a critical understanding of your own abilities as an artist inform your grade for the course in general and the assignments in particular. Your work is evaluated using criteria specific to each project assignment. Active participation in critiques is expected, as is regular attendance and attention to the reading materials.

Percentage value of assignments –

40% Short projects

20% Final project

20% Sketchbook (submissions at Week 4, midterm, final)

10% Class participation

10% Attendance

GRADE SCALE

90-100	A	Outstanding; pushing the limits of both the student's creativity and the assignment.
80-89	B	Thorough, thoughtful, and creative approach to the assignment.
70-79	C	AVERAGE; handed in on time, project completed according to minimum requirements.
60-69	D	Poor; does not meet minimum requirements.
Below 60	F	Fail; failure to complete the assignment

COURSE SCHEDULE

Class Date	In class	Doing
1/11/21	Course Intro/Course Mechanics; Work examples; Intro to Electricity Readings	Readings on Electricity **Sketchbook:** Observation Exercise One - Sensing and Actuation
1/18/21	No Class, MLK Day	Fusion 360 Tutorials **Sketchbook:** Observation Exercise One - Sensing and Actuation
1/25/21	Electricity	Safety trainings, Readings on Electronics Soldering
2/1/21	Motion	Readings on linkages and mechanical motion **Sketchbook:** Exercise Two - Mechanical Motion Soldering
2/8/21	Electronics/Fabrication 1	Readings on how to read schematics Small Project 1 assigned

2/15/21	Electronics/Fabrication 2	Small Project Critique
2/22/21	Basic Microcontroller Programming	Readings on Microcontrollers
3/1/21	Arduino Hardware workshop	Project Brainstorm Assigned
3/8/21	Motors	Project Brainstorm Due Project Feasibility/Scope Assigned
3/15/21	Instrumental Acoustics	Project Feasibility/Scope Fixed Project first iteration Assigned
3/22/21	Building Workshop	
4/5/21	Project Proposal Presentations	
4/12/21	Final Project Critique	
4/19/21	Final Project Presentation	

TECHNOLOGICAL RESPONSIBILITY

Computers Failures:

No allowance will be made for computer failure and/or network problems. Back your work up early and often to avoid problems. In addition to the local copy of your file(s) on the computer hard drive, an additional back-up should be made to your google drive space, a portable hard drive, or usb flash drive. This is more than a policy, this is best-practice for digital citizenry.

Electronic device use:

The use of laptop computers, phones, and tablets in class for note-taking, reference, and disambiguation is both appropriate and encouraged. Use of communication applications and social media platforms as well as the use of web-resources during class other than those expressly required for class work is counter-productive. Inappropriate use of any electronic device during class time will be addressed proactively.