Sample Syllabus I - Technology, Art, and Theory, Leo Kang 2017
Making and Learning through Mixed-media Conversations

INFO 4900 / Spring 2018
Wednesday, 2pm-5pm

INSTRUCTOR
Leo (Laewoo) Kang, Department of Information Science

DESCRIPTION
This class integrates aesthetic, theoretical, and engineering inquiries into more multi-disciplinary platforms for problem discovery, theory building, and research-engaged art-making. In this class, students will mainly learn how to (a) build technological objects that can engage the self-discovered research topic in playful, critical, and speculative ways and (b) produce a research-related essay about the objects by using diverse ethnographic methods. The goal of this class is to help students shape their artistic and intuitive practices to more valid research activities, ultimately enabling them to conduct human–computer–interaction (HCI) and design research through their own art and technology practices.

The class site will alternate between the seminar round table of the Information Science Department (TBA) and a studio space in the Fine Art Department (TBA). Seminars will include readings, lectures, and class discussions of theories and artworks that can interconnect research activity, engineering, and art practice. In the Tech Studio, students will be introduced to the intermediate level of physical computing and other computational skills for building technology-engaged artwork. In the Art Studio, students will be introduced to diverse hands-on and digital fabrication skills, including woodworking, old/new technology hacking, laser-cutting, and 3D printing. This class promotes emerging creativity and learning opportunities in such mixed-media conversations among theoretical texts, technology, and artistic objects.

STRUCTURE

Theory Seminar (30%)
Reading review: In the seminar session, students will explore diverse theories, methodological approaches, and artworks in broad fields of social science and HCI that promote cross-disciplinary engagement among theory study, technological development, and art-making. In each seminar, 2 to 3 students will team up and lead a review and discussion of the assigned reading and summary of its content.

Tech Studio (30%)
The Tech Studio will introduce basic and intermediate levels of electrical engineering, computer programming, and other computation skills for making technological objects. Throughout the semester, students will learn how to deal with electricity and different

electronic components, including microprocessors, motors, lights, and sensors. Based on the technical skill levels of the attending students, the subjects can be extended to MIDI, sonification, AC controls, web API, and more.

Art Studio (30%)
This studio will provide students with the tools and techniques of making multi-dimensional works required to translate learned technologies into material form and assist in the development of their projects. Students will be introduced to diverse hands-on and computational fabrications including woodworking, appropriation, hacking, 3D printing, and laser-cutting. Students will also explore issues of spatial experience, object interaction, and conditions of site as well as the basic vocabulary needed to articulate artistic and critical concepts needed for discussing their projects in a public forum and group critique.

Group Critique and Project Development (10%)
Students will be required to maintain and present documentation, drawings, notes, texts, images, and visual support to assist with the communication of ideas and intentions as well as provide further insights into the conceptual and working process. A final reflection study (10–15 pages, including references and figures) will be required from each student.

ASSESSMENT AND EVALUATION:
10% Attendance
10% Paper Presentation
15% First Project (Building improvisational technology)
15% Second Project (Writing an auto-ethnographic essay)
20% Final Art Work
30% Final Reflection Study

CALENDAR

Week 1, 1/23
Orientation

Week 2, 1/3
I. THEORY SEMINAR: *Can art practice be research method?* (1.5 hours)
  - Patricia Leavy, Method meets art: Arts-based research practice (introduction).
  - G. Sullivan (2006). Research acts in art practice. Studies in Art Education, 48(1), 19–35.

Additional readings:
  - Barbara Bolt, Practice as Research: Approaches to Creative Arts Enquiry (introduction).

- Scott Barry Kaufman and Carolyn Gregoire. (2016). Wired to create: Unraveling the mysteries of the creative mind. Penguin (introduction).

II. TECH STUDIO: *Introduction to Tech Studio* (1.5 hours)
The first tech session introduces basic tools and items that students need to purchase for this class. This session also introduces basic theories and practical rules in electrical engineering, including its safety regulations.

Week 3, 2/06
I. THEORY SEMINAR: *Art practice for learning, creativity and aesthetic experience* (1.5 hours)
- John Dewey, Art as Experience, Chapter 1, The Living Creature (pp. 1–19), and Chapter 4, The Act of Expression (pp. 60–84).

Additional readings:
- Michael Polanyi. (2009). The tacit dimension. University of Chicago Press.
- S. McNiff. (2015). Imagination in action: Secrets for unleashing creative expression. Shambhala Publications.

III. TECH STUDIO – *It is now moving, blinking, and making sound!* (1.5 hours)
This tech session introduces basic Arduino and other introductory electrical engineering skills for building things that simply blink, move, and make sound. In particular, this session explores the topics of digital I/O, PWM, and servo functions in Arduino.

Week 4, 2/13
I. THEORY SEMINAR: *Can technology-design practice be research method?* (1.5 hours)
- M. Ratto. (2011). Critical making: Conceptual and material studies in technology and social life. The Information Society, 27(4), 252–260.
- J. Zimmerman, J. Forlizzi, and S. Evenson. (2007, April). Research through design as a method for interaction design research in HCI. In Proceedings of the SIGCHI conference on Human factors in computing systems (pp. 493–502). ACM.

Additional readings:
- Anna Vallgårda and Ylva Fernaeus. (2015). Interaction design as a bricolage practice. In Proceedings of the Ninth International Conference on Tangible, Embedded, and Embodied Interaction, pp. 173–180. ACM.

II. ART + TECH STUDIO: *Laser-cutting for fast-prototyping* (1.5 hours)
This session introduces how to use a laser cutter for fast-prototyping. Through this section, students will learn how to make simple and complicated 3D objects by using Adobe Illustrator and some computational methods (processing). Safety rules and diverse acceptable and unacceptable materials for the laser cutter will also be introduced.

First Project: **Improvisational Technology**
In this project, each student will produce one or more technological objects in improvisational and constructive building process. In other words, the students are encouraged to build these objects not by following their pre-assigned goal or master plan, but through their inductive and intuitive making processes (like making collages) by employing diverse technical materials and skills learned from the class. The final form of the work does not need to have specific functions or concepts. It is due by the class on 2/20. Bring what you make, its video clip, and short descriptions that explain how they were built and what you learned from the process.

Samples: TBA

Week 5, 2/20
I. THEORY SEMINAR: *Ethnography that can shape art practice as research activity* (1.5 hours)
- F. W. Ngunjiri, K. A. C. Hernandez, and H. Chang. (2010). Living auto-ethnography: Connecting life and research. Journal of Research Practice, 6(1), 1.
- Laewoo Kang and Steven J. Jackson. (2018). Collaborative Art Practice and/as HCI Research. ACM Interactions Magazine, March–April.

Additional Readings:
- Kathy Charmaz and Linda Liska Belgrave. (2007). Grounded theory. John Wiley & Sons, Ltd.
- Sarah Pink. (2013). Doing visual ethnography. Sage.

II. First Project Group Critique – **Group Critique as ethnography** (1.5 hours)
In this session, students will present their own improvisational technologies and discuss these works' technical details, working mechanisms, motivations, and building processes. This session also introduces how we can employ visual and other ethnographic techniques as methods for explaining and understanding art work.

Week 6, 2/27
I. THEORY SEMINAR: *Emerging creativity in art-research integration* (1.5 hour)
- Laewoo Kang, Steven Jackson and Phoebe Sengers. (2018). Intermodulation: Improvisation and Collaborative Art Practice for HCI Inquiry. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. ACM.
- Nathaniel Klemp, et al. (2008). Plans, takes, and mis-takes. Outlines. Critical Practice Studies, 10(1), 4-21.

Additional readings:
M. Csikszentmihalyi. (1996). Flow and the psychology of discovery and invention. New York: Harper Collins.

II. TECH STUDIO (1.5 hours) – *It is responding to light, movement and sound!*
This tech session introduces how to make things responding to light, movement, and sound (analogue I/O, basic sensors, op-amp).

Week 7, 3/06
I. ART STUDIO (3 hours) – *Fabrication*
This full art session introduces other manual and digital fabrication skills to make things in diverse sizes and shapes. These include CNC mill, 3-D printer, and other desktop and hand tools for woodworking.

Week 8, 3/13
TECH STUDIO (3 hours) – Processing, Arduino, and IoT
This full tech session introduces the Java-based visual programing tool "Processing" (https://processing.org/), especially focused on the topic of Arduino communication. The basic idea and mechanism of IoT (Internet of thing) will also be introduced, and specific instructions for making your work by talking to your computer and the Internet will be provided.

Week 9, 3/20
Spring Break

Week 10, 3/27
I. THEORY SEMINAR: *Art is not only about something. It is something!* (1.5 hours)
- S. Sontag. (1966). Against interpretation: And other essays (Vol. 38). Macmillan.
- Langdon Winner. (1980). "Do artifacts have politics?" Daedalus, 121–136.
- Anthony Dunne and Fiona Raby. (2013). Speculative everything: design, fiction, and social dreaming. MIT Press.

Additional readings:
- Bruno Latour. (2005). Reassembling the social: An introduction to actor-network-theory. Oxford University Press.
- Sasha A. Barab et al. (2004). "Critical design ethnography: Designing for change." Anthropology & Education Quarterly, 35(2), 254–268.

II. TECH STUDIO (1.5 hours)
This session is open for any technical topics and skills that students request over the semester.

Second Project: **Auto-ethnography** and **Speculative technology**
For the second project, students will produce one technological object and its auto-ethnographic essay (5 pages, including pictures) that describes its motivation, building process, and reflective description. Students are also encouraged to use or integrate this technology for their own preferred practices, like music, performance, cooking, photography, parties, sleeping, or any practice.

Week 11, 4/03
PROJECT DEVELOPMENT STUDIO I (3 hours)
This full session is open for technical and theoretical assistance for individual students' projects.

Week 13, 4/10
I. Second Project Critique – **Learning from others** (1.5 hours)
Through both actual produced artifacts and slideshow, students will be asked to present the motivations, building processes, and learnings about the second projects. Each student is also encouraged to take notes or record the discussion of the work for subsequent reflection study.

PROJECT DEVELOPMENT STUDIO II (1.5 hour)
This half session is open for technical and theoretical assistance for individual students' projects.

Final Project: **Reflective Art practice and peer-interview study**
For the final project, students are asked to produce (a) one technological artifact (20%), and (b) an ethnographic essay that explains the object (30%). The final artifacts can be anything, including a critical device, persuasive object, game, painting, musical instrument, or even non-functional thing. The essay should be written based on a peer-interview in which a student picks one classmate and conducts a casual interview about their final works. The minimum length of this essay is 15 pages (11-point font Arial, 1.5 line-space) that includes pictures and references. The main goal of this project is to build a certain technological object using the skills learned from the class and demonstrate how critical thinking, physical making, and reflection study can be integrated to explore the socio-technical issues and problems. The final presentation of the project is 5/1, and the essay deadline is 9PM on 5/13.

Download Sample:
Leo Kang (2014): http://cornellhci.org/tat/leo_scale.pdf
Sofie Corneile (2016): http://cornellhci.org/tat/sofie_powerdove.pdf
Mind Apivessa (2017) http://cornellhci.org/tat/mind_nyc.pdf

Week 14 – 4/17
Tech, Art, Theory Open topic #2

Week 15 – 4/24
PROJECT DEVELOPMENT STUDIO II

Week 16 – 5/1
I. Final Project Critique – **Presentation**

For the first 30 minutes of this session, students are asked to install their final artifacts in a certain space within or near the classroom. Each presentation should not exceed more than 15 minutes, including discussion time. Students are also encouraged to take notes or record the class critique and apply the information to the final essay.