

Making kin with biomaterials

Building Science & Technology Elective

Columbia University | GSAPP | online | Fall 2021

Course description

The realm of the tiny and invisible has actively been ignored within modern societies, despite or exactly because modern science found out more and more about our mutual relations and dependencies with microorganisms, fungi, and other non-human species. Only recently, this situation has started to change. New scientific, computational, philosophical, and evolutionary approaches emphasize the decisive role of the microbiome in the development and maintenance of complex life-forms. In the pyramid of organic life, microorganisms not only lay the foundation but by far represent the largest part, both in numbers and in volume or weight.

With the dawning of the carbon-based period of modernity and the realization of the environmental costs that are going along with it, biological agents and materials have received a major upgrade in public recognition. Being it for substitution of carbon-based building materials or fuels, being it as a means to clean up the petromodern mess, or being it as the basis for entirely new regimes of nutrition, transport, and living, nowadays' future scenarios are full of visions for newly envisioned uses of or, rather, collaborations with microorganisms.

This course aims to theoretically and practically investigate and reveal these mutual relationships and multispecies collaborations across all scales. Students will interrogate different approaches of industrial production, conceptualize and materialize objects that propose alternative approaches and situate these artifacts within the speculative frameworks and future developments. We will be designing prototypes for interfacing with biological systems in the form of grown materials, bioreactors, sampling instruments, or bio-receptive substrates. Students will have the chance to present work-in-progress prototypes and scenarios in a public forum at the [project space 1014](#) within the framework of a series of workshops to embody and imagine life in a post-carbon society.

Learning Objectives

By the successful completion of this course, students will be able to:

- Explore new roles for design and new forms of critical engagement through collaborative work across disciplines
- Experimentation with biomaterials
- Gain an understanding of design as a mode of inquiry, and design as a means of facilitating discussion and debate
- Learn how to use fictional narratives to open a debate about alternative futures
- Combine alternative world-views with emerging technology

Course Materials

- Shared Google Drive Folder (Presentation Material & Communication)
- Physical Prototyping (We will be building objects. Expect to put up to \$50 aside for prototyping materials. We'll work on partnership options to scale up the fabricated prototypes for anything that goes beyond that.)
- Readings (will be supplied for you as downloadable PDFs or links)
- Slack
- Camera or photographic device

Example Schedule (based on a 14 week-structure):

Week 1	Part 1: Species Mutualism, Chris Wobken Part 2: Carbon Cycles and Post Petro with Cultural Researcher Alexander Klose
Week 2	Speculative Design Intro & Design Sprint
Week 3	Workshop - Sourcing biological information: How to read a scientific publication
Week 4	Virtual Field Trip: TBC
Week 5	Part 1: Communication strategies Part 2: Project 1 - Iteration 1
Week 6	Project 1 - Iteration 2
Week 7	Midterms
Week 8	Project 2 Implementation - Iteration 1
Week 9	Project 2 Implementation - Iteration 2
Week 10	Project 2 Implementation - Iteration 3
Week 11	Physical Model and Scenario visualization setup at 1014, space for ideas
Week 12	Forum at with external guests
Week 13	Documentation and Synthesis
Week 14	Final Review

Public Exhibition and Workshop

Setting: The event will take place at 1014, a project space on Fifth Avenue. 1014 5th Ave, New York, NY 10028.

Potential date: Three afternoons/evenings (3hrs), last week of October 2021

<https://www.1014.nyc>

The framework of the public facing events is a series of workshops staged within a hybrid environmental exhibition/multimedia-installation setup composed of student's contributions and artists' works, curated by Chris Wobken and Alexander Klose. In 3 different sessions participants are invited to engage with a build out setting in the exhibition space. Participants will have chances to deeply consider the details of their evolving future scenarios, and to discover unforeseen opportunities, twists and challenges.

These processes are situated within three different layers of or viewpoints on possible future developments: social and economic foundations (race/class/gender), the urban condition (transportation, energy, urban nature), and materials (a microbiological shift). Each group will focus on one of the mentioned layers, represented by the invited expert who operates as a tour guide through the installation/exhibition. In a sum-up round which marks the third stage of the process, all of the participants of the three groups will come together and share their insights and speculative outcomes.

The students are invited to both contribute installative works, displays, experimental setups, etc. and to participate in the organization and realization of the speculative workshop processes.

This exhibition event is produced in collaboration between:

Alexander Klose, cultural researcher, and curator at Office for Precarious Concepts, Berlin, Germany.

Chris Woebken, artist, educator, speculative designer and co-founder of the Extrapolation Factory, New York City, USA.

Outcomes of this collaborative research will become a write up for an online publication such as Urban Omnibus

Class Rules

Attendance

Everyone does their best to show up to class on time. If you're going to be late, let me know in advance. If you need to miss a class for a real reason, you must also let me know in advance.

Readings

Everyone does the readings. For the most part, they're short, fun, and useful. You're expected to be prepared and ready to participate in the discussion.

Assignments

All assignment work is due at the beginning of class. Everyone gets a free pass for one late assignment. After that, any assignments not ready for the start of class will be counted as incomplete. Assignments must be posted to our shared Google Drive in the appropriate folder (your name), along with the documentation.

Materials

We will be making things and building objects. Expect to spend \$100 for physical fabrication and prototyping materials.

Critiques

Every student is expected to participate in critiques and class discussions. Critiques are essential to the design process inside and outside of this class. You are expected to apply critical thinking, ask questions, and formulate and explain your opinion. The more active the discussions we have the more rewarding and ultimately fun the class will be.

Assignments and projects

Thorough and on-time completion of all assignments is essential. Failure to meet deadlines, late or incomplete assignments will dramatically reduce your grade. Repeated or chronic lateness or incomplete assignments will result in a failing grade for the course.

Deliverables

For successful completion of the class, the students will deliver:

- Signal scanning/Scenario Matrix
- Process documentation
- Project Documentation of Project 1/Project 2
- Physical Models (1:1 scale)
- Story / functional illustrations
- Website documenting the process of creation of the aforementioned project
- Physical models / hybrid digital artifacts, along with photo documentation and description
- Exhibition design, setup and online documentation

Evaluation and Final Grade Calculation

Attendance / Participation	10%
Readings*	10%
Round 1: artifact development	20%
Exhibition Design / setup	20%
Round 2: artifact development	20%
Functional illustrations	10%
Publishing & Disseminating	10%
TOTAL	100%

Inspiring Readings & viewings

- ["Donna Haraway | Making OddKin: Telling Stories for Earthly Survival"](#) video lecture, 2017
- cj Lim, "Devices: A Manual of Architectural + Spatial Machines" Routledge, 2005.
- Dunne, Anthony & Raby, Fiona "Speculative Everything: Design, Fiction, and Social Dreaming" MIT Press, 2013.
- Tsing, Anna, & others, "Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene" University of Minnesota Press, 2017.
- Peter Godfrey-Smith, "Other Minds: The Octopus and The Evolution of Intelligent Life", Farrar, Straus & Giroux. 2016.
- Hughes, Howard C. "Sensory Exotica - A World beyond Human Experience", MIT Press, 2001.
- Jeremijenko, Natalie. "[Milgram's Mice: bioinformatics in the wild](#)"
- Hénaff, Elizabeth "[Invisible Inhabitants](#)", The Journal of Design and Science (JoDS), 2017.
- Von Uexküll, Jakob. "[A stroll through the worlds of animals and men](#)", 1934.
- Nagel, Thomas. "What Is It Like to Be a Bat?" The Philosophical Review, vol. 83, no. 4, Oct. 1974.
- Shanahan, Murray. "[From Algorithms to Aliens. Could Humans Ever Understand Minds That Are Radically Unlike Our Own?](#)" Aeon Magazine, Oct. 2016.
- "[Ursula K. Le Guin Keynote Talk at the Anthropocene Conference: "Arts of Living on a Damaged Planet"](#)", video lecture, 2014.
- Tsing, Anna. "The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins", New York: Princeton University Press, 2015.
- Sanderson, Eric. "Mannahatta: A Natural History of New York City" Harry N. Abrams, 2009.
- Sullivan, Robert. "Rats: Observations on the History and Habitat of the City's Most Unwanted Inhabitants", 2005.
- Gissen, David. "Subnature: Architecture and Other Environments". New York: Princeton Architectural Press, 2009.
- Morton, Timothy. "Dark Ecology: For a Logic of Future Coexistence". New York: Columbia University Press, 2016.
- Kimmerer, Robin Wall. Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants. Milkweed Editions, 2015.
- Serafini, Luigi "[Codex Seraphinianus](#)", 1981.