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 Woebken
- 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 Woebken 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**

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Attendance / Participation</td>
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<tr>
<td>Readings*</td>
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<tr>
<td>Round 1: artifact development</td>
<td>20%</td>
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<tr>
<td>Exhibition Design / setup</td>
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<tr>
<td>Round 2: artifact development</td>
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<td>Publishing &amp; Disseminating</td>
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<td><strong>TOTAL</strong></td>
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Inspiring Readings & viewings

- Jeremijenko, Natalie. "Milgram's Mice: bioinformatics in the wild"
- Von Uexküll, Jakob. “A stroll through the worlds of animals and men”, 1934.