Eco-design Pedagogical Model and Academic Practices
-case studies from CAFA D-school, Design for Crisis and Ecology

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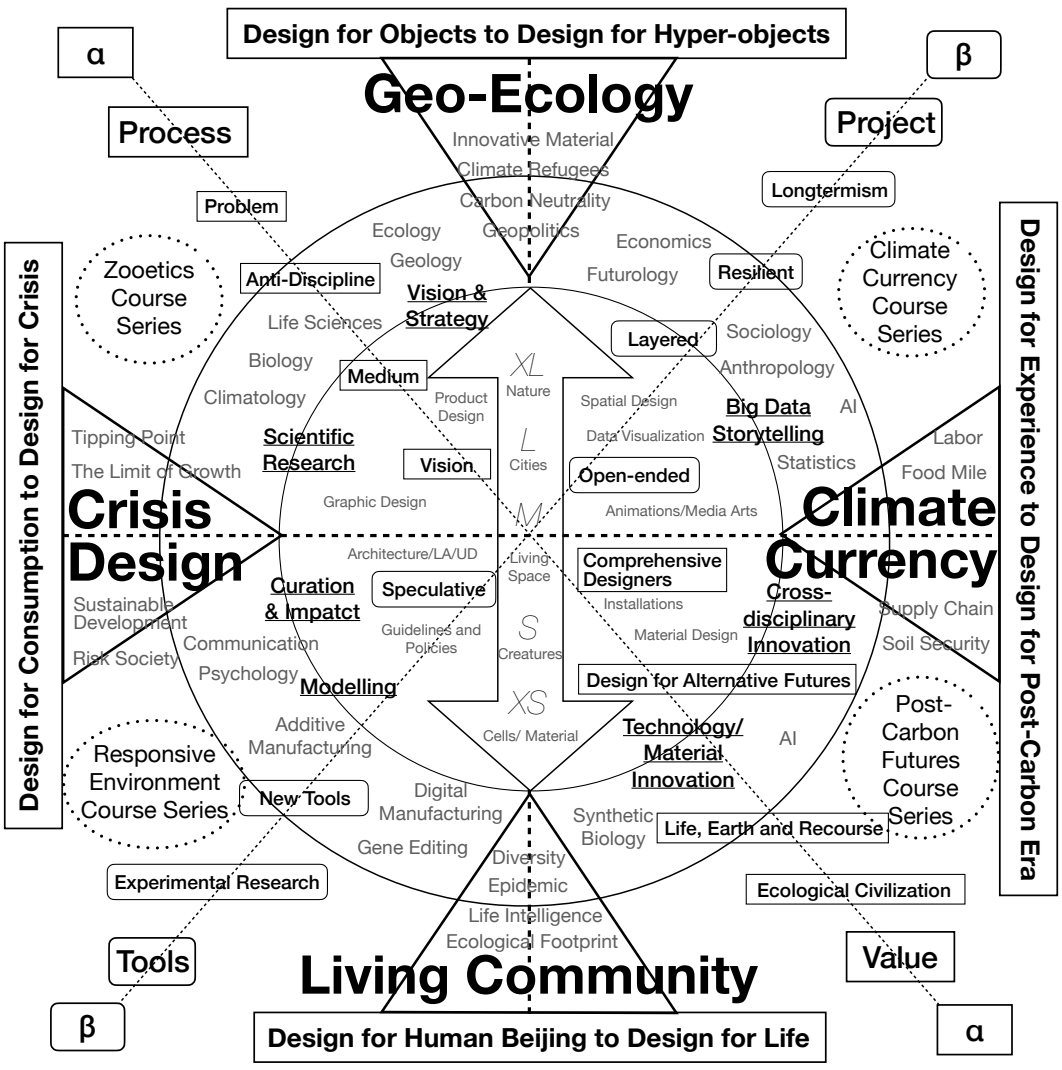
In the past 10 years, the emerging eco-design has been characterized by the following features: (1) interdisciplinary and cross-scale (2) complexity and (3) resilience facing change. New forms of eco-design research are already emerging at universities and institutions of many kinds around the world, including the Mediated Matter at the MIT Media Lab, the Biodesign and Material Futures Program at the University of the Arts London, GeoDesign at the Design Academy in Eindhoven, and Risk and Resilience at the Harvard University Graduate School of Design. With the emergence of new type of ecology design, the models and prototypes of eco-design have been gradually emphasized. Author iterates a new model for eco-design pedagogy, as well as explores the experimental path of implementation in specific courses in the Design for Crisis and Ecology program at the School of Design at the China Central Academy of Fine Arts (CAFA).

Pedagogical Model of Eco-design



1. Pedagogical Model of Eco-design

The model was validated in the five-year academic systems of the program Design for Crisis and Ecology at D-school CAFA. The model is used in cross-disciplinary design education, centered on eco-design. It could be interpreted from multiple perspectives, splited and combined. The eco-design pedagogical model can be divided into three parts. The first part is the four quadrants of southeast, northwest, and north, each quadrant is "a shift" of design. The second part is the α-axis and the β-axis, which are the criteria for designing from process to values and for designing a project-based system, respectively. The third part is a three-layered circle from the outside to the inside, called "cell membrane", "cytoplasm", and "nucleus", with the interdisciplinary fields involved in the cell membrane, the seven criteria for design evaluation in the cytoplasm, and different mediums and scales of expression of the design in the nucleus.

1.The Four Shifts of Eco-design:

From Design for Objects to Design for Hyper-objects
From Design for Human Beijing to Design for Life
From Design for Consumption to Design for Crisis
From Design for Experience to Design for Post-Carbon Era

2. From Process to Value

In the α-axis, the design process is identifying a problem and throwing out a vision

3. Project-based design criteria

The β-axis explores the criteria for project-based ecodesign

Nine Commandments for a Materials Ecology	A/B Manifesto	Criteria of Design for Crisis and Ecology
Nature as Client; Growth over Assembly; Integration over Segregation; Non-Human-Centered Design; Difference over Repetition; Decay over Disposal; Activist Design; System over Object; Technology over Typology;	affirmative vs. critical; Problem solving vs. problem finding; Design as process vs. design as medium; Provides answers vs. asks questions; in the service of shareholders vs. in the service of society; for how the world is vs. for how the world could be; science fiction vs. social fiction; futures vs. alternative worlds; fictional functions vs. functional fictions; change the world to suit us vs. change the us to suit the world; narratives of production anti-art vs. narratives of consumption applied art; research for design applications vs. research through design implications; design for production vs. design for debate; fun vs. satire; concept design vs. conceptual design; consumer vs. citizen; makes us buy vs. makes us think; innovation vs. provocation; ergonomics vs. rhetoric;	Longtermism over short-term interest; Resilient over settled; Layered over single dimension; Open over answered; Speculative over proven; New tool development over available tool employment; Experimental research over Information-gathering research;

Course Case 1: Climate Currency Project

Course Case 2: Zooetics

Course Case 3: Responsive Environment

2. Academic Case Studies of Eco-Design

Since 2019, the Crisis and Ecological Design Direction of D-school CAFA has launched a series of interdisciplinary and innovative courses, including the following features: (1) taken by students from different professional backgrounds; (2) inviting interdisciplinary faculty teams; (3) requiring students to learn the technical skills on their own; and (4) completing work in a short period of time. The series of courses fall into different quadrants of the model, with topics entangled. The sophomore and junior years have implemented a small open-loop system, that is the courses of this two years can be chosen by each other. Offered in the second year is an 8-week, 96-hour integrated design course. Offered in the third year is a 4-week, 48-hour professional and technical methods course. The number of students enrolled in each course is less than 20, with most of them have taken courses in graphic design, digital media, social design, art and technology, fashion design, and jewelry design. So the students' mindsets and design skills are quite diverse.

	Climate Currency Course	Responsive Environment Course	Zooetics Course
Course Unit	Food and Everything; Ecology and Crisis; Community and City; Vision and Empowerment;	Ecology Landscape; Crisis Design; Parametric Nauture; Ecology Curation;	Wet Lab; Dry Lab; Ethics Lab; Generation Lab;
Cross-discipline	Food systems, ecology, global history, anthropology, nutrition, economics, data visualization;	Ecology, Biology, Synthetic Biomaterials, Geography, Geology, Life Sciences, Pathology;	Microbiology, synthetics, climatology, ecology, computer science, futurology;
Course objective	-Responding to national issues; -Research on locality and landedness; -Impact on local/consumer issues;	-Focusing on issues from macro to micro; -Comprehensive design capabilities;	-Interdisciplinary experiments; -Microcosmic view of problems.
Difficulties	Concretizing intangible national policies, cutting-edge, experimental and practical; reconciling the cutting-edge with the local;	How to visualize abstract and grand ecological issues and translate scientific research into visual and pictorial perceptible solutions	Understand and familiarize yourself in a short period of time with synthetic biology techniques, life science knowledge, metacellular automata, and other high-threshold scientific knowledge and principles
Teaching Form	-Methodology and Theory Lectures -Reading and speaking One-on-one tutoring -Community and local co-creation	-Methodology and Theory Lectures -Technical workshops -One-on-one counseling	-Methods and Theory Lecture；-Experimental Workshops -Readings and presentations -One-on-one tutoring
Work Media	Product Design, New Material Design, Artificial Intelligence Design, System Design, Landscape Design, Industry Chain Design, Game Design, Installation, Instruction Manual, Experimental Performance	New material design, installation, sculpture, discursive design, games,	Biomaterials, Clothing, Jewelry, Data Visualization, Installation, Documentary, Book, Discursive Design, Video
Course Extension	-Exhibition "Planet Planet at the Table" -Exhibition "Third Nature at the Table" -Exhibition "Food Testing Ground" -Exhibition "Xinjiang Biennale"-"New Food". -Teaching material "Sustainable Food Design	-2050 Ocean Conference -Shenzhen-Hong Kong Biennale-Youth Panel	-Translation of Biodesign -Translation of the book "Bioart". -Translation of Material Ecology