

Syllabus

Coordinates

Master program	Year 1, 2 & 3	First Semester
Seminar course	Fall 2013	Weeks 1 to 17
Lead: Pius Leuba (雷朴实)	Lei_pushi@sina.com	13801699691
Co-teacher: Zhu Xiaocun (朱小村)	zhu_xiaocun@sina.com	13801699722
Assistant:		
Location: Tongji, SiPing Road 1239	Building: ZhongHe Lou	Room: 1602
Day: Wednesday	Time: 10:00 – 11:40	Classes: 3 & 4
Web platform: QQ/ QQ international		

Course Background

The development mode and policies of the 20th century start showing frightening consequences and humanity is dealing with increasingly monumental environmental and social problems. Sustainability issues have come to the forefront of design in the last 30 years and developed from a laughed-at trend to a crucial aspect of our profession today.

However, most of the initiatives for more sustainability are still in the mindset of “doing less bad” instead of actually “doing good”.

Course objectives

The goal of this course is to make the students aware of the reality, urgency and severity of today's sustainability issues. The course shall primarily

- help students understand what Biomimicry is, and how inspirational and beneficial it can be to emulate natural strategies for innovative human development, creation and production.
- illustrate that nature solved literally all of humans' sustainability problems already, in a sustainable way
- provide tools, methods and skills for practicing biomimetic design
- provide knowledge inside and outside students' own design discipline, in order to get the 'big picture' and allow for true innovation
- instill constant thinking about nature, health and sustainability when designing

Course content

week

1. 仿生设计 Introduction to Biomimicry & Biomimetic Design
2. 课堂汇报 Book Presentations
3. Book Discussion
- 4.

h

- 绪论：仿生学和仿
(6学时)
指定参考书阅读和
(4学时)
参考书阅读讨论
(2学时)
仿生设计案例一

	Biomimetic Design Case Study 1	(4 学时)
5.	报 Biomimetic Design Case Study 1 Presentations	仿生设计案例一汇 (2 学时)
6.	论 Biomimetic Design Case Study 1 Discussion	仿生设计案例一讨 (2 学时)
7.	Biomimetic Design Case Study 2	仿生设计案例二 (4-6 学时)
8.	报 Biomimetic Design Case Study 2 Presentations	仿生设计案例二汇 (2 学时)
9.	论 Biomimetic Design Case Study 2 Discussion	仿生设计案例二讨 (2 学时)
10.	念及讨论 Research Project Conception & Discussion	仿生学研究项目概 (4 学时)
		(32-34 学时)

Study means

The communication of knowledge and expertise as well as the learning will mostly occur through discussions, which employ online content, readings, case studies, research and insights from academic work. The assimilation, comprehension and integration of this new knowledge will occur in discussions, student presentations, exchange, self-study and the final proposal of a research project.

Class time and non-class time make up about 1/3 and 2/3 respectively of the total work time of this course.

A list of books is provided below, from which each student must completely read at least three books.

Book list

参考书 Books

1. Biomimicry: Innovation Inspired by Nature, Harper Perennial, 1997 Benyus, Janine. M,
2. Biomimicry in Architecture, RIBA Publishing, 2011 Pawlyn, Michael,
3. Bulletproof Feathers: How Science Uses Nature's Secrets to Design Cutting-Edge Technology, University Of Chicago Press, 2010 Allen, Robert,
4. The Gecko's Foot: Bio-inspiration: Engineering New Materials from Nature, W. W. Norton & Company, 2006 Forbes, Peter,
5. ARCHITECTURE without architecture: Biomimicry design, VDM Verlag Dr. Müller, 2010 Ginatta, Carlos,

6. Myers, William,
Bio Design: Nature Science Creativity, Thames & Hudson, 2012
7. Gruber, Petra,
Biomimetics in Architecture: Architecture of Life and Buildings, Springer, 2010
8. DeYoung, Donald,
Hobbs, Derrik, Discovery of Design, Master Books, 2009
9. Vogel, Steven,
Cats' Paws and Catapults: Mechanical Worlds of Nature and People, W. W. Norton & Company, 2000
10. Kellert, S. R.,
Heerwagen, Judith, Mador, Martin, Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life, Wiley, 2008
11. Beatley, Timothy,
Biophilic Cities: Integrating Nature into Urban Design and Planning, Island Press, 2010
12. Kellert, S. R.,
Wilson, Edward O, The Biophilia Hypothesis, Island Press, 1995
13. Kellert, S. R.,
Building for Life: Designing and Understanding the Human-Nature Connection, Island Press, 2005
14. Imhof, Barbara;
Gruber, Petra, What is the architect doing in the jungle? Biornametics, Springer, 2013

参考文献 Papers

1. Benyus, Janine M. A Biomimicry Primer, The Biomimicry Institute and the Biomimicry Guild, 2011: <http://biomimicry.net/about/biomimicry/a-biomimicry-primer/>
2. Green, Keith E., The "Bio-logic" Architecture - Environmental Design Inspired by Slime Mold, Lichen and Other Natural Sources, PDF, ACSA National Conference, Chicago, 2005: http://workgroups.clemson.edu/AAH0503_ANIMATED_ARCH/linked%20docs/Bio-logic%20of%20Architecture.pdf

Assignments and Examinations

No examination will be held in the final two semester weeks (exam weeks). Students' performance will be assessed 100% through course work assignments. Assignments will be based on lecture contents, the students' current studio projects and current issues of sustainability. Assignments may encompass self-study and observations, text reviews and critiques, case studies, conceptual texts, etc.

Assessment & Grading

Class involvement and contribution may significantly raise a student's grade. Class attendance is expected throughout and random records will be used to correct grades up or down. A written, justified explanation to the coaching team is necessary in case of non-attendance. Class attendance of at least 80% is required to pass the course.

Depending on the assignments, each student will receive group grades and/or individual grades that are weighted according to importance and their average will constitute the final grade. The final grade may be adjusted based on aspects below.

This course treats design as a field of ongoing research and creativity. Thus the students are invited to propose creative, future-oriented and innovative ideas and concepts, based on thorough study of feasibility and the life-quality and sustainability issues at hand.

Plagiarism (copying) is warned. Acknowledgement must be given to **any and all** references, ideas and sources of information used to produce any of your work.