

2011 Summer Course Outline

Introduction to Biomimicry

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Anamarija Frankić (Assistant Professor, EEOS) has been working for more than 25 years in the field of integrated ecosystem management and stewardship. Her interest is in developing and applying innovative educational, research and outreach methodologies to help solve environmental issues in situ, right here and now. In doing so, she recently started with her students the Green Boston Harbor Project (GBH): www.gbh.umb.edu; where students have an opportunity to develop and work on projects within the coastal and watershed areas. Dr. Frankić builds her work on the premise that ‘environment sets the limits’ for sustainable life. She has brought her expertise and services to many research and stewardship projects on the local, state, national, and international levels.

Why Biomimicry?

Biomimicry is an innovation method that seeks sustainable solutions by emulating nature's time-tested patterns and strategies, e.g., a solar cell inspired by a leaf with chloroplast and chlorophyll. The goal is to create products, processes, and policies by learning from and ‘listening to’ nature that has been evolving and accumulating wisdom for 3.8 billion years.

Biomimicry is inspired by nature to study the structure and function of biological materials for the purpose of analogous synthetic design and manufacturing. It is an abstraction from nature into a sustainable technical object, process and/or life cycle.

Topics

- What is biomimicry and why is it important?
- Biomimicry principles, concepts, and methodologies
- How biomimicry relates to natural sciences, engineering, design, architecture, and sustainability
- Biomimicry solutions and new inspirations for addressing environmental and other challenges
- How do we learn from nature? How do we ask nature? How do we live in harmony with nature? (examples of strategies for listening to and learning from nature's designs)

Learning outcomes

Students will learn about six key biomimicry life’s principles and their applications:

1. Evolve to survive
2. Be resource efficient
3. Be resilient
4. Integrate development and growth
5. Be locally attuned and responsive
6. Live using water-based chemistry and self-assembly

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COURSE RELATED REFERENCES

Books:

Biomimicry: Innovation Inspired by Nature (2002) by Janine Benyus. USA Perennial
Natural Capitalism (2002) by Paul Hawkin, Amory Lovins & Hunter Lovins (www.natcap.org)
Cradle to Cradle (2004) by William McDonough

Websites:

Biomimicry Guild: www.biomimicryguild.com
Biomimicry Institute: www.biomimicryinstitute.org
Biomimicry Newsletter: <http://biomimicry.typepad.com/newsletter>
The Center for Ecoliteracy: www.ecoliteracy.org
Ask Nature: www.asknature.org
<http://www.biomimicry.info/reviewoftheliterature>
<http://www.biomimicry.info/examples>

Additional resources:

<http://www.youtube.com/watch?v=n77BfxnVlyc>
<http://www.youtube.com/watch?v=BiMZYdVLqME>
<http://www.youtube.com/watch?v=JnBkbaFsZOY&feature=related>
<http://www.designboom.com/contemporary/biomimicry.html>