

**COURSE: Low Energy and Environmental Building Design- Ecological Construction**

This course primarily covers the theoretical background of ecological design and the relationship between natural and artificial, but progressively it covers more specialized issues of low energy-ecological design in agreement with international norms, and ends up with the analysis of a design project.

Course	Title	Instructor(s)
1	Urbanization as a n irreversible procedure	K. Panigiris
2	Urban dispersion. The spreading of cities and the development of infrastructures.	K. Panigiris
3	The imminent environmental destruction and <i>The Drowned World</i> by J.G.Ballard.	K. Panigiris
4	Natural Cities-Artificial natures: Examples of the emergence of a new subjectivity.	K. Panigiris
5	Energy use in the built environment	A. Tsagkrasoulis
6	Ecological Construction-Design Parameters- Construction Materials	K. Adamakis
7	Internal environment quality -Thermal Comfort	A. Tsagkrasoulis
8	Special issues of Low Energy Design #1	A. Tsagkrasoulis
9	Special issues of Low Energy Design #2	A. Tsagkrasoulis
10	Special issues of Low Energy Design #3	A. Tsagkrasoulis
11	Assigning of projects-Building Environmental rating Systems Leadership for Energy and Environmental Design, <a href="http://www.usgbc.org/leed/">www.usgbc.org/leed/</a> BREEAM: BRE Environmental Assessment Method, <a href="http://www.bream.org">www.bream.org</a>	A. Tsagkrasoulis K. Adamakis
12	Project	A. Tsagkrasoulis K. Adamakis K. Panigiris
13	Project	A. Tsagkrasoulis K. Adamakis K. Panigiris
14	Submitting the projects	A. Tsagkrasoulis K. Adamakis K. Panigiris

## Bibliography

- “Energy and Climate in the Urban Built Environment” by M. Santamouris (ed)
- “Κτίρια , ενέργεια, περιβάλλον», Π. Κοσμόπουλος (επιμ.)
- «Οικολογική Δόμηση», Εκδ. Ελληνικά γράμματα.
- “Sun, Wind & Light: Architectural Design Strategies” by G. Z. Brown & M. DeKay
- “Sustainable Construction: Green Building Design and Delivery”, by Charles J. Kibert
- “Ecology of Building Materials” by Bjorn Berge
- “Daylighting for Sustainable Design”, by Mary Guzowski
- “Light revealing architecture”, by Marietta Millet
- “Daylight Performance of buildings”, by M. Fontoynt (Ed.)
- “Daylight Design of Buildings”, by N. Backer & Koen Steemers
- “Solar Energy in Architecture and Urban Planning”, by Thomas Herzog (Ed.)
- “Sustainability at the Cutting Edge, Second Edition: Emerging Technologies for low energy buildings” by Peter Smith
- “The Green Studio Handbook: Environmental Strategies for Schematic Design”, by Alison Kwok & Walter Grondzik
- “Heating, Cooling, Lighting: Sustainable Design Methods for Architects” by Norbert Lechner
- “Passive and Low-Energy Cooling of Buildings”, by B. Givoni
- “Design with Climate: Bioclimatic approach to architectural regionalism” by Olgyay V.
- “Design with nature: The ecological basis of architectural design” , Ken Yeang
- “Ecological Design”, Sim Van der Ryn , Stuart Cowan
- “Gentle Architecture”, Malcom Wells
- “The Hannover Principles: Design for Sustainability: Hannover Germany for Expo 2000”, William McDonough
- “Ten Shades of Green: Architecture and the Natural World” by Peter Buchanan and Kenneth Frampton
- “Green Architecture” by Philip Jodidio
- J.G. Ballard, *The Drowned World*, (London 1962)
- Reyner Banham, *Los Angeles: The Architecture of Four Ecologies* (London 1973)
- Georges Bataille, *The Accursed Share, Volume 1: Consumption*, trans. Robert Hurley (New York 1991)

	<ul style="list-style-type: none"> <li>• Manuel de Landa, <i>A Thousand Years of Nonlinear History</i>, (New York 2000)</li> <li>• Gilles Deleuze/ Felix Guattari, <i>A Thousand Plateaus: Capitalism and Schizophrenia</i> (Minnesota 1987)</li> <li>• James Gleick, <i>Chaos: Making a New Science</i>, (New York 1987).</li> <li>• Kevin Kelly, <i>Out of Control: The New Biology of Machines, Social Systems and the Economic World</i> (Reading 1994)</li> <li>• Rem Koolhaas dir., <i>Project on the City 1: Great Leap Forward</i>, (Cambridge 2001)</li> <li>• Rem Koolhaas, Stefano Boeri, Sanford Kwinter, Nadia Tazi, Daniela Fabricius, <i>Mutations</i> (Barcelona 2000)</li> <li>• Sanford Kwinter, <i>Far from Equilibrium: Essays on Technology and Design Culture</i> (Barcelona 2008)</li> <li>• Bjorn Lomborg, <i>Cool it: The Sceptical Environmentalist's Guide to Global Warming</i> (London 2007)</li> <li>• James Lovelock, <i>Gaia: A New Look at Life on Earth</i> (Oxford 1979)</li> <li>• Ilya Prigogine/ Isabelle Stengers, <i>Order Out of Chaos, Man's new Dialogue with Nature</i>, (London 1984)</li> <li>• Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," <i>Illuminations</i> (New York 1996)</li> <li>• Martin Heidegger, "The Question Concerning Technology," <i>Basic Writings</i> (San Francisco 1977)</li> <li>• Georg Simmel, "The Metropolis and Mental Life," <i>The Sociology of Georg Simmel</i> (New York 1950)</li> </ul>
Software	<ul style="list-style-type: none"> <li>• Esp-r (<a href="http://www.esru.strath.ac.uk/Programs/ESP-r.htm">www.esru.strath.ac.uk/Programs/ESP-r.htm</a>)</li> <li>• Energy + (<a href="http://apps1.eere.energy.gov/buildings/energyplus/">http://apps1.eere.energy.gov/buildings/energyplus/</a>)</li> <li>• Passive House Planning Package</li> </ul>
Norms	EN 15251 , «Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics»
Equipment	<p>Depending on their projects the students will have access to :</p> <ul style="list-style-type: none"> <li>• Artificial sky (full dome)</li> <li>• Heliodon</li> <li>• Instrumentation for measuring environmental conditions</li> </ul>