Developing a 21st-Century University: Yonsei University, Songdo GAC

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I. Songdo Global Academic Complex
History of Yonsei University

History
- Dr. H.N. Allen founded Kwanghyewon in April 10, 1885
- Chosun Christian College was founded by Dr. H. G. Underwood in 1915
- Yeonhee College became Korea’s first modern college in 1917
- Severance Medical College and Yeonhee College merged to become the Yonsei University

Campus Overview
- Yonsei University has two campuses: main campus is in Seoul and the branch campus is in Wonju
- The Songdo Global Academic Complex in Incheon will open partially in 2010 and fully in 2012
Songdo Global Academic Complex
Eco-Campus Design for Songdo GAC
Key Components of Eco-Campus Design

<table>
<thead>
<tr>
<th>No.</th>
<th>Key Component</th>
<th>Description</th>
<th>Elements</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Site Planning and Landscape Design</td>
<td>- Develop the site in an environmentally sensitive manner. - Integrate and maintain valuable landscapes. - Design may be for main pedestrian, bicycle, and motorized accessibility.</td>
<td>1. Site analysis 2. Site planning 3. Landscape design 4. Accessibility planning</td>
<td>Site Planning and Landscape Design</td>
</tr>
<tr>
<td>2</td>
<td>Daylighting</td>
<td>- Importance of daylighting - Consider high-efficiency lighting fixtures - Evaluate the use of daylighting for energy savings. - Daylighting can be enhanced through façade design and integrated light fixtures.</td>
<td>1. High-efficiency lighting fixtures 2. Façade design 3. Integrated light fixtures</td>
<td>Daylighting</td>
</tr>
<tr>
<td>3</td>
<td>Energy Efficient Building Shell</td>
<td>- Energy use is a major component of building energy flow as well as conducting heat loss and gains.  - Heat sources such as solar heating should be considered in building design. - Design of buildings should maximize use of passive solar heating.</td>
<td>1. Heat sources 2. Building design 3. Passive solar heating</td>
<td>Energy Efficient Building Shell</td>
</tr>
<tr>
<td>4</td>
<td>Solar System</td>
<td>- Solar power systems can be designed in the design stage. - Solar power systems can be designed in the design stage. - Solar power systems can be designed in the design stage. - Solar power systems can be designed in the design stage.</td>
<td>1. Solar power system 2. Design stage 3. Integration of solar power systems</td>
<td>Solar System</td>
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<td>5</td>
<td>Energy Efficient Lighting and Electrical Systems</td>
<td>- Energy efficient lighting systems are designed to reduce energy consumption while maintaining lighting levels. - Design should consider the use of energy-efficient lighting technologies. - Electrical systems should be designed to minimize energy consumption.</td>
<td>1. Energy-efficient lighting systems 2. Design stage 3. Integration of electrical systems</td>
<td>Energy Efficient Lighting and Electrical Systems</td>
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<tr>
<td>6</td>
<td>Energy Efficient Ventilation Systems</td>
<td>- Energy-efficient ventilation systems are designed to reduce energy consumption while maintaining indoor air quality. - Design should consider the use of energy-efficient ventilation systems.</td>
<td>1. Energy-efficient ventilation systems 2. Design stage 3. Integration of ventilation systems</td>
<td>Energy Efficient Ventilation Systems</td>
</tr>
<tr>
<td>7</td>
<td>Environmentally Sensitive Building Products and Systems</td>
<td>- Consider the costs and environmental impacts of products, materials, and resources. - Design should consider the use of environmentally sensitive products and materials.</td>
<td>1. Cost and environmental impacts 2. Design stage 3. Integration of environmentally sensitive products and materials</td>
<td>Environmentally Sensitive Building Products and Systems</td>
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<td>8</td>
<td>Indoor Air Quality</td>
<td>- Design should consider the indoor air quality. - Design should consider the indoor air quality. - Design should consider the indoor air quality. - Design should consider the indoor air quality.</td>
<td>1. Indoor air quality 2. Design stage 3. Integration of indoor air quality</td>
<td>Indoor Air Quality</td>
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<td>9</td>
<td>Water Conservation</td>
<td>- Design should consider the water conservation. - Design should consider the water conservation. - Design should consider the water conservation. - Design should consider the water conservation.</td>
<td>1. Water conservation 2. Design stage 3. Integration of water conservation</td>
<td>Water Conservation</td>
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<tr>
<td>10</td>
<td>Recycling System and Waste Management</td>
<td>- Design should consider the recycling of materials during construction. - Design should consider the recycling of materials during construction. - Design should consider the recycling of materials during construction.</td>
<td>1. Recycling of materials 2. Design stage 3. Integration of waste management</td>
<td>Recycling System and Waste Management</td>
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<tr>
<td>11</td>
<td>Transportation</td>
<td>- Design should consider the use of public transportation. - Design should consider the use of public transportation. - Design should consider the use of public transportation. - Design should consider the use of public transportation.</td>
<td>1. Public transportation 2. Design stage 3. Integration of transportation</td>
<td>Transportation</td>
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<tr>
<td>12</td>
<td>Commissioning and Maintenance</td>
<td>- Design should consider the commissioning process. - Design should consider the commissioning process. - Design should consider the commissioning process. - Design should consider the commissioning process.</td>
<td>1. Commissioning process 2. Design stage 3. Integration of commissioning</td>
<td>Commissioning and Maintenance</td>
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<tr>
<td>13</td>
<td>Eco Education</td>
<td>- Design should consider the use of eco-education and awareness programs. - Design should consider the use of eco-education and awareness programs. - Design should consider the use of eco-education and awareness programs. - Design should consider the use of eco-education and awareness programs.</td>
<td>1. Eco-education programs 2. Design stage 3. Integration of eco-education</td>
<td>Eco Education</td>
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Sustainable Building Design

Site Planning & Landscape Design
Transportation
Water Conservation / Rain Water Utilization

Building
Daylighting & Natural Ventilation

Environmental Sensitivity Building Products & Systems

Energy Efficient Lighting & Electrical Systems
Energy Efficient Mechanical & Ventilation Systems
Energy Efficient Energy Production & Supply Systems

Integration of Site / Building / System
Integration of Structural, Envelope, Interior Partition, M&E
Integration of Building / Operation / User

Sustainable Energy & Environment Center

Facility Management [Operation & Maintenance]
Sustainable Energy & Environment Centre
Building Energy Management Programme
Recycling System and Waste Management
Integrated Strategies
Sustainable E&E Center
Songdo GAC: Bird’s Eye View (2)
II. Education for Sustainable Development
Emerging Energy & Climate Issues

Energy & Environmental Problems

Global Issue

Education could be one of the most effective tools
Exponential growth in population, industrial output, and food demand generate declines in resources and increasing pollution, which force a catastrophic reversal of growth by the mid-twenty-first century.

Meadows, 1992, p.133
World Oil: Duncan & Youngquist, 1998
Educational Objectives & Strategies

Educational Objectives

- Cultivate the environmentally friendly decision makers
- Train advanced environmental researchers with an international competitive capability
- Fulfill the social and global responsibility through education

Strategies

- Multidisciplinary & Holistic Approach
- Community Based Education
- International Cooperation
Energy & Environmental Programs

### Education
- Liberal Arts: 7 subjects
- Colleges: 3
- Graduate schools: 4 majors
- Specialized Graduate schools: 2
- Extensive programs: 2

### R & D
- Hydrogen Fuel Cell Research Center
- Center for Clean Technology
- Center for Sustainable Housing
- Near Zero Emission Vehicle Research Center
- Center for Sustainable Society

### Activities
- Eco-campus
- ISO14001 at Wonju Campus
- Yonsei RCE
- Restoration of Cheonggyecheon
Current Education Program

- 7 Courses
- Interdisciplinary & holistic approach
- Value-oriented education
- Driven for action

General Education

Undergraduate Education

Graduate Education

Extensive programs

- 4 colleges (College of Science / College of Engineering / College of Human Ecology / College of Health and Environment)
- Fundamental knowledge and skills for specific fields

Build the Capacity for a Sustainable Future

- 4 colleges (College of Science / College of Engineering / College of Human Ecology / College of Health and Environment)
- Specialized graduate program focusing on new energy and environmental issues
- 2 programs (Framework Convention on Climate Change / Administrative Expert on SD)
- Continuing education for experts
On the Road to ESD

Paradigm Shift

Economic Approach

Social Approach

Environmental Education

Education for Sustainable Development

- Economic
- Social
- Environmental
Short-term & Long-term Plan

**Short-term**
- Raise Public Awareness on Sustainable Development
- **Organization and Active participation**
- Guarantee Multi-Stakeholder Participation
- Provide Training for Trainers: Leadership for SD
- Establish Cooperation between different sectors

**Long-term**
- Widen Understanding of Ecosystem and Human Activities
- Provide Vision for Sustainable Development
- Become a Leading Local Community of Sustainable Future
- Establish Korean and Global Model of EfSD
Stage 1: Innovation of System
- Reform curriculum
- Reset research goals
- Construct community-based education system

Stage 2: Development & Dissemination
- Develop & implement holistic education programs
- Strengthen capacity of individual actors
- International networking

Stage 3: Evaluate & Feedback
- Implement
- Evaluate results
- Feedback

Strategy of Implementation
III. Sustainable Campus Initiatives
Yonsei Eco Forum

- Established the ‘Yonsei Eco Forum’ in 2001
- Established ‘the Sustainable Development Research Center’ in 2002

**Main Activities**

Workshops and International Seminars

Develop Interdisciplinary Courses: ‘Living in Harmony with the Environment’

Research: “A Study on Creating Eco Campus in Sinchon (2003)”

“A Study on Sustainable Campus Development in Songdo GAC (2007)”
Yonsei Regional Center for Expertise

MULTI-STAKEHOLDER PARTICIPATION

University & Institution
- School
  - Student
  - Teacher
  - Parent
- Informal/Nonformal Education
  - Sea Center
  - Youth Center

Regional Government

Private Sector
- NGO
  - Agenda 21
  - YMCA/YWCA
- Media
  - Newspaper
  - KBS

International Organization
- UNU
- UNESCO
- UNEP

YONSEI RCE
Green Campus Initiatives in Korea

- Yonsei University Wonju Campus was accredited the ISO 14001 in 2000
- Established ‘the Yonsei Eco Forum’ in 2001
- Established ‘the Sustainable Development Research Center’ in 2002 (renamed the Center for Sustainable Society)
- Report to the President on “the Eco Campus Development in Sinchon Campus" in 2003
- Established the Yonsei RCE Center at IEWS in 2006
- Appointed the Yonsei University Chief Environmental Officer in 2007 --> Formed ‘the Yonsei Green Campus Committee’
- Established 'the Korean Association of Green Campus Initiatives' in November 2008
Thank You!