Green Design and Planning

"Only 60 years ago (1930), there were 2 billion of us… a total that had taken 250 million years to attain. Today, there are more than 5 billion (1990); and by 2025, there could be more than 10 billion."

Norman Myers

As we enter the 21st century, designers and planners are facing a new set of challenges, far more demanding than the issues of the past. The world population has tripled in less than a century. Most of the growth has occurred in emerging cities with few resources. Some African cities are now growing 10% a year. Architects and planners are entering a new environmental era, which focuses on green design, alternative energy, infrastructure, and planning systems that support sustainable development.

The greatest problems are occurring in emerging nations, enticed by the seduction of development. As their economies grow, they’re repeating the mistakes of old industrial nations. They’re investing in private cars, rather than public transportation. They’re utilizing more energy than ever before, and creating larger cities without the necessary infrastructure and resources.

Developed cities are also struggling with growth. The population of Tokyo is approaching thirty million people. London is fighting urban sprawl. New York is burdened with increasing costs. The population is stable, but the costs of maintaining century old systems has grown. In California, energy demands have reached epic proportions, but the California lifestyle continues to attract growth.

Architects and planners are responding to these issues by creating sustainable designs. In recent years, they’ve developed new concepts for green buildings, green masterplans, regional transportation, and new environmental technologies. Engineers have introduced controversial ideas like solar power satellites, wind powered skyscrapers, and transatlantic tubes. Innovative urban planners have created urban regional corridors, disbursed urban centers, artificial islands, and new underground systems.

This course introduces the issues of green design and planning through an arts workshop. It begins with a brief history of environmental issues from the 19th century industrial revolution to the present. It also traces the development of environmental solutions, such as public transportation, zoning laws, building codes, public parks, landscape systems, infrastructure, and planning theories. New concepts in green architecture, new materials like structural fabrics and plastic wood are also introduced.

The class also explores new solutions to urban and environmental problems, including concepts in green housing, town planning, urban master plans, and resource development. Slide lectures analyze innovative planning approaches, such as artificial islands, disbursed urban centers, and mobile structures for emerging countries. Green buildings, based on LEED certification are also discussed.

Students develop several environmental projects, exploring issues of product design, architecture, and planning. They include the design of a roof terrace, creation of a recycled product, and analysis of an urban park. The assignments include writing, research, photographic studies, map studies, models, drawings, and computer images. Students should have access to a camera and basic drawing tools.
Required Reading taken from the following books:

McDonough, William, and Braungart, Michael, *Cradle to Cradle*, pages 3-186

Recommended Reading on Environmental Topics

Dean, Angela M., *Green by Design*
Girardet, Herbert, *Cities, People, Planet*
Gissen, David, ed., *Big and Green*
Herzog, Thomas, ed., *Solar Energy in Architecture and Urban Planning*
Kunstler, James Howard, *Geography of Nowhere*
Mau, Bruce, *Massive Change*
Powell, Kenneth, *City Transformed*
Siegal, Jennifer, *Mobile Architecture*
Slessor, Catherine, *Eco-Tech*
Wines, James, *Green Architecture*

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Materials: Available at Blick’s, Pearl Paint, Lee’s Art Store, Utrecht, or other art supply stores

- 12” or 14” roll of inexpensive white tracing paper (typically 20 yds.)
- 24” T-square, (metal is better than wood) or a Parallel Rule, (Mayline is a good brand.)
- Inexpensive Lead or Pencil Sharpener
- Drafting Board (and board cover, if needed)
- Design and Layout Kit or the following tools: Lead holder and 2 Leads (H or 2H) or Pencils, H or 2H Pencil Eraser and Ink Eraser
- 12” triangular architectural scale or standard 12” ruler
- 2 Triangles (30,60, 90 degrees and 45 degrees)

Students should also have access to a camera, computer, and modelbuilding tools.

Optional Materials: 11”x 17”mylar sheets, as needed, inexpensive technical pens, #0, #000, #2 Drafting Brush, Adjustable triangle, Erasing Shield, Bathroom/Kitchen Template

Criteria for Grading:

- class participation in discussions
- depth of analysis of design issues
- concept and design development
- quality of visual & verbal presentations
- individual growth and improvement
- satisfactory completion of all projects

Note: Incompletes are only allowed in cases of illness or extreme necessity and must be planned before the last week of classes

Plagiarism: NYU has a strict policy on plagiarism, copying projects, and related issues. If any student is caught developing work in an illicit manner, there will be consequences. Please consult the Gallatin Bulletin or Gallatin website for a full description of the academic integrity policy. ([http://www.gallatin.nyu.edu/academics/policies/policy/integrity.html](http://www.gallatin.nyu.edu/academics/policies/policy/integrity.html))
1. First Week: Introduction: The 21st Century Environmental Dilemma

a. 21st Century Legacy: Overpopulation, Urban Expansion, New Demand for Products, Resources, Infrastructure, Global Economy, Pollution, Efforts at Environmental Law
b. Film: *The Art and Science of Renzo Piano*, and/or sequence from *New York: A Documentary Film* on the development of the New York City grid plan
c. Reading: Goodman, pp. 7-13, 22-33, 38-50
d. Project Discussion: Spatial Organization
e. Assignment: Create a model, based on spatial organization and kit-of-parts concepts explored in class. Do not glue down the pieces; they will be used to develop experiments. Create spatial layouts based on the grid, linear, centralized and organic concepts. Make a record of your final layouts, using the system described in the handout.

2. Second Week: The Impact of the 19th Century Industrial Revolution; Early 20th Century Proposals

a. Industrial Revolution: Railroads, Factory Conditions, Slum Housing, Pollution, Immigration, Growth of Cities, Building Codes, Parks; Howard, Garnier, Wright
b. Presentation: Bring the spatial organization model and present concepts in the class exercise.
c. Film: *River of Steel*
d. Project Discussion: Present Spatial Organization. Introduction to Roof Terrace Project
e. Reading: Goodman, pp. 91-94, 99-109, 119-149 on electrification, industrial design, automobiles, New Deal infrastructure, and the war era
f. Assignment: Create a concept for a roof terrace on an NYU building, overlooking Washington Square. Develop a program for its use, a floor plan, and a parti or design concept.

3. Third Week: Nature and Urbanism

a. War and Postwar Eras, Housing Shortage, Technologies, Mass Production, Automobiles, Levittown
b. Film: sequences from *New York: A Documentary Film on Robert Moses*
c. Reading: Goodman, pp. 161-174, 177-182, 189-191, 195-198, 201-207, 222-226 on mid-century modernism, the space age, post-modernism
d. Project Discussion: Development of Plans and Elevations
e. Assignment: Develop plan and elevation. Research and choose green furniture, lighting, materials, and landscaping. Create a page on materials, furniture, and green elements of design.

4. Fourth Week: From the Space Age to Postmodernism: Issues Leading to a New Environmental Era

a. Historical Development: Hi-Tech Design, ‘50’s Futurism, Failures of Modernism, Megastructure, b. Postmodernism, Pop Architecture, Limits to Growth, Theme Parks, Urban Decay and Renewal
c. Film: *Portland: A Sense of Place*
d. Reading: Goodman, pp. 229-268 on the evolution of green design principles
e. Project Discussion: Axonometric Drawing and/or Computer Images
f. Assignment: Develop the plan, elevation, axonometric and/or perspectives. Create diagrams on the function and spatial organization.

President’s Day: no class

5. Fifth Week: A New Environmental Era: Building Skins, Green Materials, and Related Concepts

c. Film: *Greening the Federal Government*
d. Reading: McDonough and Braungart, pp. 3-44
e. Project Discussion: Preparing Final Presentation, Choice of materials, landscaping, and furniture
e. Assignment: Complete the booklet for final presentation next week. Write an introduction and complete pages on parti and historical reference, plan, elevation, axonometric and/or perspective, diagrams on function and spatial organization, materials and details.

6. Sixth Week: Transforming Traditional Business and Consumption Systems

a. Market Systems: Cradle to Cradle Design vs. Cradle to Grave, Problems Caused by Global Trade
b. Technological Alternatives, New Concepts in Design and Manufacturing
c. Film: Sequence from *The Next Industrial Revolution*
d. Reading: McDonough and Braungart, pp. 45-91
e. Project Discussion: Present Roof Terrace Project. Introduction to “This is not a Pipe.” exercise
e. Assignment: Create a concept for reusing a discarded object in a new product. Create sketches, plan, elevation, research, and text on the trash problem and potential new use of the material.

Spring Break: No Class

7. Seventh Week: Green Products, Recycled Materials, Market Issues

b. Marketing Environmental Principles, Development of Recycled Products
c. Film: Sequence from *Koyaanisqatsi*
d. Reading: McDonough and Braungart, pp. 92-141
e. Project Discussion: Eco-products, Alternative Concepts and Materials
f. Assignment: Complete “This is not a Pipe” exercise. Revise the design, based on critique. Illustrate an application. Prepare for final presentation next week. It should include 2-3 pages, 11” x 17,” with a plan, elevation, sketches, product research, and text on the design.

8. Eighth Week: New Concepts in Park Development

a. New Park Planning Strategies, Transformation of Expanding Urban Centers to Increase Green Space
b. Reading: McDonough and Braungart, pp. 142-186
c. Film: Sequence from *New York: A Documentary Film* on Central Park
d. Project Discussion: Present: This is Not a Pipe Exercise; Introduction to Park Project: Photographs
e. Assignment: Create a photographic essay on Washington Square Park with the following images:

1. People and Functions: playgrounds, chess, bocci ball, picnic tables
2. Art and Structures: buildings, statues, the arch, the fountain
3. Landscape and Design Details: signs, furniture, types of trees and plants
4. Park Problems: Crime, homelessness, garbage, bad usage of park space


a. Big and Green: Designing Skyscrapers, Green Mechanical Systems and Furnishings, Roof Systems
b. Reading: Steffen, pp. 11-26, 351-381 on individual responsibility and business practices
c. Film: *The Green Apple*
d. Project Discussion: Creating Maps and Diagrams for Urban Planning Projects
e. Assignment: Develop a masterplan of Washington Square Park. Make copies of the masterplan. Draw diagrams of the following planning concepts. Create a key for each map.
1. Function: Create a map of major park functions, also show seating areas
2. Landscape and Circulation: Create a map of landscaped areas and paths
3. Structures and Art: Create a map indicating structures and public art
4. Park Problems: Create a map designating park problems

10. Tenth Week: Urban Design: Applying Art and Political Activism to Transform Urban Spaces
   a. Reinvigorating Depressed Urban Areas, Reducing Carbon Emissions, Zoning through Time
   b. Reading: Steffen, pp. 72-119 on new directions in design
   c. Guest Speaker or Film: Bogota: Building a Sustainable City
   d. Project Discussion: Rendering from a Photograph in Black and White and/or Color
   e. Assignment: Write an introduction to the booklet, which describes the history of the park and create a rendering from one of your photographs. Write a description of the park problems

11. Eleventh Week: Disaster Relief, Concepts for Areas Damaged by Poverty, War, and Natural Disasters
   a. Refugee Housing, Mobile Design, Portable Schools and Medical Facilities, Kit-of-Parts Systems
   b. Reading: Steffen, pp. 305-349 on emerging communities and disaster relief
   c. Film: Energy for a Developing World
   d. Project Discussion: Developing a Park Concept, Use of Computer Images
   e. Assignment: Create an idea for improving the park. Draw a plan; do research on the general concept and write a short statement. Also develop a site plan and sketches, if appropriate.

12. Twelfth Week: Special Issues of China and Emerging Nations, New Towns and Megacities
   a. Urban Theories for Emerging Areas; Multiple Transportation Systems, Vitality of the Slums
   b. Reading: Steffen, pp. 121-189 on green systems, energy grids, and buildings
   c. Film: China: From Red to Green
   d. Project Discussion: Project Development
   e. Assignment: Develop the park proposal. It should include a plan, elevation, and a three dimensional drawing or a site plan, if the concept is a planning proposal. Most concepts should also include an introduction, information on materials and details and appropriate diagrams

   b. Reading: Steffen, pp. 191-251 on cities and mobility
   c. Film: sequence from Who Killed the Electric Car?
   d. Project Discussion: Preparation for final presentation
   e. Assignment: Create final presentation for next week. The booklet should include a cover rendering, an introduction, photographs, maps, critique of park problems, and park proposal.

14. Fourteenth Week: Final Presentations of Park Project
   a. Presentation: Present final recycling project.
   b. Film: Sequence from Frank Lloyd Wright: Fallingwater or an alternative film

Note: The schedule may change, depending on availability of the films and guest speaker. The schedule may also be affected by the pace of development of student projects.
In this exercise, the design process is experienced through a three dimensional exercise, exploring forms and spatial organizations. It begins with the construction of a massing model, a kit-of-parts, which will serve as a basis for experimenting with various spatial arrangements. The massing model will include several groups of Platonic solids in a variety of sizes and shapes. Using paper, foam core, clay, or cardboard, create the following pieces:

**Platonic Solids**

1. six cubes ..................... 1" wide x 1" deep x 1" high
2. two cylinders ................... 2" high x 1" diameter
3. two pyramids ................... 2" high x 1" square base
4. four tall rectangular boxes...... 3" high x 1" x 1" square base

**Base:** Make a base for the model in cardboard or foam core, 11”x 17.” Draw a 1”x 1” grid on the base

1. Layout a design for each of the following spatial arrangements, using the model to explore various possibilities. **Do not glue the pieces.** Keep them free for further exploration and presentation of designs

   a. create a plan that emphasizes the grid
   b. create a plan that emphasizes a centralized concept
   c. create a plan that has an organic concept
   d. create a plan that uses a linear concept

2. Draw a plan of each concept, so that you’ll remember each design. Begin by making at least 4 copies of the grid base, then indicate the location of pieces for each layout in following manner:

   a. a square represents a cube
   b. a circle represents a cylinder
   c. a triangle represents a pyramid
   d. a rectangle represents a rectangular shaped piece

**ROOF TERRACE**

You have been asked to create a design for a roof terrace on an NYU building, overlooking Washington Square. The new facility should provide a place for students to enjoy a view of the park and work or relax in an outdoor environment. The program allows the designer to create a small indoor snack bar on the roof or another type of small indoor space in addition to the outdoor facilities. The outdoor space should include sitting areas, plants, and other appropriate elements.

First Week: Create a concept for the roof terrace. Is it a quiet space for study, a lively space for social events, or space dedicated to a particular use, such as a sculpture garden or a special type of planted area. Develop a parti or design concept for the terrace; it could be based on the spatial organization concept, the use of the new space, or a design idea. Write a short introduction to the project. Describe the site, program, and basic concept of the design.

Draw a floor plan of the concept at ¼” = 1’-0.” Include a parapet wall, which is 3.5’ high.

Second Week: Rework the plan, based on the critique. Draw an elevation and an axonometric or perspective drawing of the space. Begin research on materials, plants, and furniture for the roof terrace. Explore new concepts online for green elements and materials.
Third Week: Redevelop the plan, elevation, and axonometric or perspective drawing, based on the critique. Review ideas for green furniture, art, lighting, materials, plants, and other landscaping. Create a page on materials and furnishings that includes information on green principles and techniques.

Fourth Week: Complete the booklet. Finalize the architectural drawings, introduction, and pages on parti or design concept, historical references, materials and furnishings, function, and spatial organization. Assemble the booklet. Prepare for a final presentation. If possible, use the Google program, Sketch-up, to create additional drawings.

THIS IS NOT A PIPE

The Dadaists, particularly Marcel Duchamp, created controversial art, by taking objects out of their usual context and displaying them as art in an exhibition. A chair was no longer a chair, but a work of art. An ordinary brush was no longer a brush, but a work of art.

In 1926, Rene Magritte made a painting of a pipe, but then added the words, "This is not a pipe," to the bottom of his painting. His words raised several questions. If it’s not a pipe, what else can it be? Is it a well designed object appropriate for another use?

In the current context, this concept could be applied to the idea of recycling. Millions of products are discarded each year without any consideration of their potential reuse. In this exercise, “This is not a pipe,” serves as a basis for suggesting that most products could be redefined as something else, rather than discarded after their initial use has been completed.

Assignment

1. You have just been hired to design a product for recycling. Choose an object that is well-designed and invent another use for this object, after it has been discarded. Write a few paragraphs describing how the object can be reused. Include a brief analysis of the relationship between the old design and function of the object and the new design and function. Describe how the object would be altered to prepare it for reuse; also describe the materials, colors, and details of the design.

2. Create at least two pages of sketches and written material. The first page should describe the existing object; it could include a photograph or a sketch, descriptions of its use, information on the materials and the manufacturing process, and statistics on the number of products discarded each year. The second page should describe the new use of the object and should include drawings of the new product, showing a plan and an elevation of the object. Also include a sketch of the object being used in the manner your proposal has described. Use two 11” x 17” sheets of paper to present your work.

ANALYSIS OF WASHINGTON SQUARE PARK

The NYC Parks Commission is interested in improving Washington Square Park. They have asked for proposals, examining the existing conditions and providing ideas for improvements. They may want to add a kiosk, a work of art, or landscaping. Proposals must begin with an analysis of current conditions. The analysis will include a historical research, a photographic study of current conditions, maps and diagrams of the park, drawings, and a critique of park problems. The proposal can be a small structure to introduce a new facility, a landscape concept, or a general planning proposal that improves park services.
First Week: Create a photographic essay of Washington Square Park. Develop one 11” x 17” page on each topic listed below. Write a title and add a few paragraphs of text on each page.

1. Art and Structures: art, buildings, fountains, major spaces
2. Landscape and Paving: trees, grass, hedges, bushes, flowers, stones, paving, seating
3. People and Functions: playground, chess, dog run, general seating, other activities
4. Issues and Problem Areas: the homeless, areas not being used, awkward signs or fences

Second Week: Develop a masterplan of Washington Square Park. The plan can be created by walking through the park or looking down at the park from Kimmel or another building on Washington Square. Since the layout is somewhat symmetrical, some areas of the plan can be reproduced from a template of one area. Make 6 copies of the basic masterplan. Draw diagrams of the following planning concepts. Create a key for each map.

1. Function: Create a map of major park functions, also show seating areas
2. Landscape and Circulation: Create a map of landscaped areas and paths
3. Structures and Art: Create a map indicating structures and public art
4. Park Problems: Create a map designating park problems

Third Week: Write an introduction to the booklet, which describes the history of the park and a description of its current use and significance. Choose a photograph that best expresses your idea of Washington Square Park, for the cover of your booklet. Create a rendering from your photograph or a freehand drawing of the park. The rendering can be developed by tracing a photograph of the park and developing the image in pencil or ink. Color may be added after the black and white drawing is complete. Photoshop can be used if a student is uncomfortable with drawing. To create the rendering:

1. Print a copy of a photograph of the park.
2. Create a line drawing in either ink or pencil. Make several photocopies of the line drawing for the purpose of conducting experiments.
3. Do several short experiments, in ink or pencil, to determine which medium you will use. Create a “slice of the rendering” to explore the development of light and shadow. Express black, white, and at least three shades of gray, if using pencil. If using ink, show various degrees of light and dark areas through dots or lines.
4. Experiment with various methods of depicting a tree, grass, sky, water, and other elements in the photograph. Choose a style of drawing that best expresses the concept.
5. Optional: To try color; experiment on another copy with colored pencils or markers.

Fourth Week: Create a proposal for improving the park. Write a description of your concept and draw a plan of the concept. Indicate the location of your proposal on an unused map. You can choose to either create a new structure in the park, like a small outdoor theater, a snack bar, a pavilion, or a bicycle storage area. If you don’t wish to design a structure, you can introduce a work of art, improve a system, such as signage, lighting, or trash collection, or work on a paving and landscaping issue.

Fifth Week: Choose materials, develop details, diagrams, and historical references as discussed in class. Refine the plan and site plan, based on critique. Draw an elevation.

Sixth Week: Create a three dimensional image of the concept, either an axonometric, a model, or a perspective sketch. As an alternative, create a more extensive information page on green design systems. Complete the booklet for final presentation next week.