



## Syllabus

### ARCH 1250 Applied Environmental Studies

Spring 2012 Semester (3 credits)

January 30, 2012

**Course Description:** The application of the fundamental techniques of site planning principles and the use of topographical maps and models. This course will explore the importance of site development as it relates to architecture and sustainable site development. Graphic and model presentation skills are required.

**Prerequisite:** ARCH 1100 with a grade of C or higher

**Pre or corequisites:** ARCH 1211 and MAT 1275 or higher

**Required Materials:** Architectural and Engineering Scales, Calculator, Colored Pencils, Notebook

**Attendance Policy:** No more than 2 absences are permitted during the semester. For the purposes of record, two late arrivals are equal to one absence. Exceeding this limit will expose the student to failing at the discretion of the instructor.

**Grading:** Every worksheet, quiz and project will be graded and the student's progress will be evaluated and monitored. Professionalism and punctuality in meeting deadlines will be stressed. Copied, borrowed or 'shared' work will be considered cheating, and will result in a grade of F for the project and possibly a final grade of F. **Three absences will result in a complete final grade lower than earned.** Three times arriving to class late will equal one absence.

Final grades will be determined as follows:

30% Homework

30% Quizzes

40% Team Project (entire team received the same grade)

**Academic Integrity:** Students and all others who work with information, ideas, texts, images, music, inventions and other intellectual property owe their audience and sources accuracy and honesty in using, crediting and citation of sources. As a community of intellectual and professional workers, the college recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension and expulsion.

### **Learning Objectives:**

Upon successful completion of this course the student should be able to:

1. Explain the different factors to be considered to produce a field study for a given site.
2. Grade a site using cut and fill to alter existing contours.
3. Apply zoning concepts and restrictions including OSR and FAR.
4. Understand how climate, topography, hydrology, geology and views affect site and building design.
5. Effectively integrate site planning into the architectural design process.
6. Explain how access to the sun and daylight influences site planning and the building envelope.
7. Understand how the fundamentals of ecological design are applied to building sites and create integrated opportunities between buildings and site.
8. Define and compare rating systems for evaluating sustainable planning.

### **Assessment:**

Students will be given quizzes, will participate in class discussions and will complete a group project that tests their ability to:

1. Identify the different factors of a site that are important in evaluating its best use.
2. Re-grade a site to accommodate a new use and to properly direct the flow of run-off while minimizing the effects of erosion and the disruption of existing topography and vegetation.
3. Complete zoning study calculations and identify setback restrictions of a site to determine the buildable volume options of a proposed building.
4. Produce a set of inventory and analysis drawings based on a site visit.
5. Perform a site inventory and analysis and evaluate these for a specific programmed use, to determine appropriate locations available for a new building.
6. Work as a team to create an organized presentation of a design that responds to basic site planning principles and present it to the professor and student peers for discussion and review.

**Assignments:** Each student is responsible for turning in all assignments on the day the assignment is due even if absent. Assignments should be submitted in the form specified for each submission by the professor. On the first day of class each student must exchange their email address and phone number with at least 2 other students. If absent, it is the student's responsibility to contact another member of the class or to see the instructor to find out what was assigned for the following class.

**Assignments are due on the date determined by the instructor and late work will be downgraded.** A student will receive a penalty of 1/3 grade for each class the assignment is late. If the project deserves an A- but was delivered two classes late, the student will receive a B grade. (From A-, to B+, to B.) This penalty will be enforced even if the student is absent from class on the deadline day. Do not stay home from class if your assignment is not complete. Instead, present your questions and difficulties to the instructor so we can all learn.

**Quizzes:** Quizzes when given will begin promptly at the start of class and will last no more than 20 minutes. A student arriving 10 minutes late to class will only have 10 minutes to complete the quiz. Do not arrive late!

### **Course Outline:**

#### **Week 1: Overview and Introduction to Site Planning**

What is Site Planning? What is Ecological Design? Overview of the site planning process and use of Topography, Climate, Hydrology, Vegetation and Geology. Applied Environmental Studies (sustainable site design) integrates best practice site planning with ecological design fundamentals.

**Homework:** Ecological footprint exercise.

#### **Week 2: Climate - Macroclimate**

Macroclimate and the influence of latitude, mountains, and large bodies of water. Our atmosphere, global warming, climate change and the urban heat island. Climate zones, the sun, solar orientation, solar insolation and seasonal change. Discussion of some indigenous building forms as response to climate.

**Homework:** Solar position and building access to sunlight calculation.

**Team Project:** Introduction to Group Projects

#### **Week 3: Field Trip and Climate – Microclimate (in field)**

Microclimate and the influence of local factors including landforms, buildings and building elements, wind conditions, ground cover and vegetation. Illustrate how building and site forms shape microclimate and affect human comfort. Introduce bioclimatic chart. Discussion of building orientation and massing to optimize interior daylighting.

**Homework:** Bioclimatic chart exercise

#### **Week 4: Site Ecology – Geology, Soils (continued Microclimate)**

Earth and rocks, soil ecology, weathering, bearing capacity, drainage, erosion, sliding, subsidence, seismic activity and swelling. Review of soil testing tools including borings and test pits. Review environmental contaminants, remediation strategies and definitions (brownfield, greyfield, etc.).

**Homework:** Solar position and building access to sunlight calculation.

**Week 5: Site Ecology – Water (Hydrology)**

The Hydrologic Cycle, rainwater as a resource, surface (stream, pond, lake, wetland) and ground water systems. Site water balances (use, reuse and treatment systems). Changing municipal storm water requirements.

**Homework:** Site water balance.

**Week 6: Site Ecology - Plants and Animals**

Introduction to site biology and the role of plants and animals in sustaining ecosystems. Discussion of biodiversity, habitat loss, green corridors and urban food supply systems. Review of plant requirements and the particular challenges of our urban settings, including heat islands, pollution, access to water, roof gardens and vertical gardens. Introduce plant illustration conventions.

**Homework:** Green corridor

**Week 7: Site Analysis - Inventory**

Review of natural and built site assets central to resourceful site design and conventions for surveying, mapping and notation. Include understanding of neighborhood/district and city/regional resource flows and built infrastructure. Tools and conventions for surveying and visualization.

**Homework:** Mapping exercise (term project)

**Week 8: Site Analysis- Assessment**

Introduce methods of site analysis through overlay mapping and flow and connectivity diagrams. Include role of shadow studies and historical and cultural resources. Discuss qualitative vs. quantitative approaches.

**Homework:** Continue mapping exercise with detailed overlays (term project)

**Week 9: Site Circulation**

Site supports for pedestrian and vehicular movement. Walkways, pedestrian protection, bicycles and bikeways, roadways and car parking. Linking to and supporting mass transit systems.

**Homework:** Circulation diagrams (term project)

**Week 10: Topography and Grading: Day 1 / 2**

Overview of topography and how it influences site design. Introduction to the concepts of grading, cut and fill, and application to surface drainage.

**Homework:** Topography exercise (term project)

**Week 11: Topography and Grading Day 2 / 2**

Problem solving and in-class grading worksheets. Strategies for reducing earth work and protection of soil ecology and groundwater, minimizing erosion, protecting flora and fauna. Review Civil Engineering drawing conventions and site planning systems including retaining walls and drainage systems.

**Homework:** Grading exercise (term project)

**Week 12: Land Use Requirements - Zoning, Site Density and Open Space**

Occupancy, Use, Open Space Ratio (OSR), Floor Area Ratio (FAR), setbacks, site coverage and density. Development of these concepts in NYC including history and recent contextual and PlaNYC supporting initiatives.

**Homework:** Zoning exercise (term project)

**Week 13: Land Use Requirements – Ecological protections, Municipal Greening Initiatives**

Wetland and endangered species protections, wildlife and green corridors, native plant requirements. NY State DEP, NYC Zoning maps and other online resources for legal site descriptions, site protections/constraints and information visualization. PlaNYC.

**Homework:** Habitat support (term project)

**Week 14: Final Class**

Term project work session

**Week 15: Final Presentations**