CRP 5850
“Sustainable and Resilient Infrastructure + Planning”

Syllabus + Course Policies, Fall 2014

Course Description:
This course will evaluate planning through the lens of developing larger scale infrastructure that fosters long-term environmental sustainability and anticipates extreme climate events brought on by our changing climate. A sustainable and resilient infrastructure has the highest likelihood of reducing long-term capital and operational costs, while also creating a healthy and enriching towns and cities.

Time + Location: Thursdays: 5:30-8pm at 50 West 17th St, 2nd Floor
Instructors: Benjamin Shepherd (bas338@cornell.edu) + John An (jsa1@cornell.edu)
TA: Emily Hackerson, efh43@cornell.edu (TBD "studio hours")

Course Aims + Objectives:
• This course will walk through key infrastructure topic areas – energy, water, transportation, natural resources and ecology – and frame the discussion around the key issues to consider and evaluate in planning for a sustainable and resilient infrastructure.
• The course will help students develop a tool-kit of approaches and strategies to approach and address projects at planning and infrastructure scale.

Format + Procedures:
Lecture and seminar format with student presentations, guest lecturers, and field trips.

Readings:
Weekly lectures, readings and weblinks will be posted to the Blackboard website. In addition, there are two “required” texts for this class. One optional text is also listed below.
• Resilient Cities: Responding to Peak Oil and Climate Change, Newman et al.
• The Works, Anatomy of a City, Ascher
• Optional – Sustainable and Resilient Communities by Stephen Coyle

Course Requirements:
Attendance is mandatory. Students shall provide advance notice of any necessary absences. Students are required to attend all lectures and actively participate in the course discussion. Each unexcused class absence will result in a point deduction from your total score. More than three (3) unexcused absences will result in a failing grade. Attendance will be taken within the first 15 minutes of the class and it is the responsibility of the student to make sure they sign-in.

Methods of Assessment:
Emphasis will be placed on the quality of assignment submissions, presentations and overall class participation. There will also be a final project submission. All assignments, and the final project presentation, will be graded on a point system and the final grade will depend on the total number of points achieved during the semester. Mid-terms grades will be distributed.

• Class attendance is mandatory (see course requirements above)
• Participation in class discussions: 30%
• Final research project submission: 70%

Academic Integrity:
Each student in this course is expected to abide by the Cornell University Code of Academic Integrity, which can be found at: http://cuinfo.cornell.edu/Academic/AIC.html. Any work submitted by a student in this course for academic credit will be the student’s own work, except in cases where collaboration is expressly permitted by the instructor.
Tentative Schedule:

- **Sep 4th** Week 1: Introduction: What is a sustainable and resilient approach to infrastructure and planning? Why should we care?
  - How did we get here (to where we are today)?
  - Where do we want to go (vision for future 2020/2050 & Beyond...)
  - Course overview, introductions, issues, trends and exemplary case studies.

- **Sep 11th** Week 2: Policy/ Starting point: What’s driving this and why?
  - How do we define and set appropriate boundaries, targets and metrics. Also discussion on issues of scalability.
  - PlaNYC, EcoDistricts, 2030 Districts- Seattle, SF SPUR, etc.

- **Sep 18th** Week 3: Resiliency & Disaster Preparedness
  - Urban Green/ Building Resiliency Task Force Report & Recommendations
  - Case Studies: Far Roc Competition, etc.
  - Introduction of Final Project

- **Sep 25th** Week 4: Energy Infrastructure
  - From utilities to district energy systems, distributed generation, to peak shaving strategies, renewables, etc.
  - What happens when the grid goes down? Energy resiliency
  - Possible Site Visit: NYU Cogen Plant?
  - Guest Speaker: Griffin Reilly, ConEdison

- **Oct 2nd** Week 5: Water Infrastructure
  - Integrated resource planning from conventional wastewater treatment plants to grey and blackwater systems
  - Planning for rising extreme climate events and rising sea levels
  - Possible Site Visit: Blackwater treatment system in a condominium
  - Guest Speaker: Alan Cohn NYC DEP & Zach Gallagher

- **Oct 9th** Week 6: Mid-Semester Project Review

- **Oct 16th** Week 7: Transportation: Multi-modal to conventional systems
  - Discussion of adjustments in space and programming in building needed to accommodate different transportation approaches.
  - Guest Speaker on local initiatives: Mike Flynn, Sam Schwartz Engineering

- **Oct 23rd** Week 8: Planning around solar as a resource
  - Impact of street orientation, building spacing and density, and façade materials on the lighting/ daylighting performance of individual buildings.
  - Solar for passive survivability
  - Guest Speaker: Jessica Zofchak, Sr. Environmental Designer, Atelier Ten

- **Oct 30th** Week 9: Urban ecology, redefining nature within the city context
  - Overview of the emerging field of urban ecology, design opportunities and biofiltration.
  - Overview of Sustainable Sites Initiative (SITES) & project application

- **Nov 6th** Week 10: The Global Context: Climate Change, Adaptation and the Future of Global Cities
  - Guest Speaker: Cassie Flynn, Climate Change Policy Specialist
• Nov 13th Week 11: Economic Perspective/ Addressing sustainability for a portfolio of buildings
  o Guest Speaker: Jay Black, Director of Sustainability, SL Green

• Nov 20th Week 12: Pre-Final Design Review or Other Lecture (Students Pick Topics)
  o Pre-Final Design Review
  o Benchmarking, above and beyond LEED: An exploration of environmental benchmarking systems and their applications to projects, including: Estidama, LEED, Living Building Challenge, etc.

• Nov 27th Thanksgiving Break – NO CLASS

• Dec 4th Week 13: Final Class/ Final Project Due & Reviewed in Class
  o Final Project Boards/ Presentation/ Review
  o Putting it all together, Trends and Takeaways
  o A Vision for the Future...