Brooklyn College  
Department of Geology

Geology 613: Earth Science in the NYC Urban Environment

**General Information**

Class Time: One Evening (TBA) + Weekend Fieldtrips  
Classroom: TBA  
Prerequisites: None  
Instructor: Wayne Powell (wpowell@brooklyn.cuny.edu)  
Textbooks: All textbooks in this course are optional. Recommended texts to support this course are:  
Equipment: Field Notebook, Camera, Hand-lens, Thumb-drive  
Webpage URL: [http://academic.brooklyn.cuny.edu/geology/powell/613webpage](http://academic.brooklyn.cuny.edu/geology/powell/613webpage)

**Assessment**

Reports and Guides  
- Building Stone of Lower Manhattan Guidebook (Group) 20%  
- Central Park Guidebook (Individual) 15%  
- Prospect Park Virtual Fieldtrip (Individual) 10%  
Homework 10%  
Midterm Exam (Take-home) 5%  
Final Exam (In-class) 35%

**Learning Objectives:**

- Students will be able to describe, recognize, and name the common geological materials (rocks, sediments and buildings stones) of the New York City area.  
- Students will be able to recognize, name, and interpret common glacial features of the New York City area.  
- Students will be able to predict the durability of geological materials in the NYC environment.  
- Students will be able to describe the geological history of the NYC region  
- Students will be able to discuss the role of geology in NYC history.  
- Students will be able use informal educational resources in NYC to teach earth science.  
- Students will be able to use Powerpoint and Word to create graphic-rich teaching documents
Outline of Topics:

Week 1: Of what is the city built? Part I
- Classification of rocks (geological and architectural)
- Visual and physical properties of granite, marble, limestone, sandstone, and a selection of rocks not commonly used for building stone
- Effective description of rocks
- Homework: Description of stone in your school (Due Week 2)
- Homework: Documentation of geological features along the subway lines (Due Week 6)

Week 2: Of what is the city built? Part II
- Presentation and critique of homework stone descriptions
- Description of building stone in Brooklyn College buildings with follow-up critique

Week 3A: Of what is the city built? Part III -- Field Trip of Lower Manhattan Building Stones
- Meet in churchyard of St. Paul's Chapel (Church St. between Fulton St. and Vesey St.) at 11AM
- End at Fraunces Tavern (54 Pearl St) at 3PM
- Document and describe building stones used in the Financial District
- Homework: Presentation of example guidebook layout and descriptions (Due Week 5)
- Homework: Guidebook (Due Week 7)

Week 3B: Optional Computer Skills Workshop
- Using Powerpoint
- Inserting and annotating photographs into Word documents

Week 4: On what is the city built? Part I
- Qualitative analysis and description of New York City area rocks and sediments
- Classification and naming of NYC materials
- Prediction of properties of materials for durability and permeability

Week 5: On what is the city built? Part II
- Presentation and critique of example guidebook layout and site description
- Geography and physiographic provinces of the New York City region

Week 6: Of what is the city built? Part III
- Examine topographic, geologic, and cultural maps of NYC
- Presentation of geological features documented along subway lines
- Compare and contrast geographic features with the underlying geology

Week 7: Wrap-Up and Review of Geological Materials of NYC
- Guest Speaker: Prof. Charles Merguerian, Hofstra University
- Patterns in use of materials observed on Lower Manhattan field trip

Week 8: How has the NYC environment changed? Part I
- Submission and discussion of midterm exam
- Tectonic history of the NYC area

Week 9: How has the NYC environment changed? Part II
- Pleistocene history of NYC area
- Glacial landforms and features
Week 10: How has the NYC environment changed? Part III -- Field Trip to Central Park
  - Meet at Monument to the Maine (SW corner of Central Park, Columbus Circle) at 11AM
  - End at Carousel in Central Park at 3PM
  - Describe rocks of Central Park and deduce their geological history
  - Document the weathering and erosion of materials in Central Park, and deduce the processes responsible for the weathering
  - Homework: Guidebook (Due Week 12)

Week 11: How has the NYC environment changed? Part IV
  - Examination of historic and recent maps of New York City. What has changed in the shape of the city? Hypothesize as to how and why the land changed?
  - Geologic issues in land reclamation and remediation

Week 12: How has the NYC environment changed? Part V -- Field Trip to Prospect Park
  - What geologic/topographic features are prominent in the park? Document their features and prepare a guidebook with photos. Identify the glacial features.
  - Homework: Virtual Fieldtrip and Associated Lesson Plan (Due Week 14)

Week 13: Why did the city develop here? Part I
  - Coal resources of the northeastern US
  - Metal resources of the northeastern US

Week 14: Why did the city develop here? Part II
  - Geologic features and formation of New York Harbor region
  - The New York Bight, Verrazano Narrows, Hudson River