

## Using Non-formal Resources to Teach Science and Sustainability

New York University  
Steinhardt School of Education  
Department of Teaching & Learning  
SciEd- 2050, Section 001 (3 graduate credits)  
SciEd-1050, Section 001 (2 undergraduate credits)  
Fall 2020 Fridays 10:00 a.m. - 1:00 p.m.\*

Professor: Dr. Mary J. Leou  
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Email: [mary.leou@nyu.edu](mailto:mary.leou@nyu.edu) (Please allow 24 hours for response to emails M-F)  
Office Hours: By appointment (Zoom, conference call or other suitable communication platform)

\*NOTE: The length of each session may vary depending on speakers and activities. Most sessions will run for 2 to 2.5 hours. Please allow for this variability in your schedule.

### **Course Overview:**

In this course, students will learn about the variety of non-formal settings as contexts for teaching and learning about science, sustainability, and the urban environment. Students will consider their roles as teachers and learners to link activities with inquiry, reflection and practice, through virtual and real world experiences. Place is used as a theoretical framework to examine learning that takes place in parks, botanic gardens, museums, field stations and in a variety of private and public organizations. Students will learn and understand how to develop linkages between formal and non-formal learning by designing equitable and culturally responsive curriculum materials for learners of all ages.

The course is open to graduate and undergraduate students interested in non-formal learning. It is particularly useful to pre-service teachers and environmental educators preparing for careers in both formal and non-formal settings.

### **Course Objectives:**

Students will experience a variety of non-formal settings and outdoor resources that can be used to teach science concepts and environmental issues.

Students will learn how to develop engaging virtual and on-site curriculum materials for learners of all ages and abilities.

Students will reflect on the relationship between formal and non-formal learning.

Students will develop on site and virtual field trip plans that are inclusive, culturally responsive, and age appropriate for a variety of learners.

September 2020

Students will meet and engage with education professionals in a variety of contexts and settings.

Students will learn to use non-formal settings to promote equity, critical thinking, systems thinking, civic engagement, and interdisciplinary teaching and learning.

Throughout the course students will examine the intersectionality of racial justice and environmental issues.

### **Assignments:**

#### **Reflections/Writing Assignments (25%)**

Students will be given 5 short writing assignments. Some will be critical reflections on classroom experience or book reviews, others on assigned readings, videos, or podcasts. Prompts and additional instructions and due dates will be provided in Google Classes. (Sims, ECE, Braiding Sweetgrass, Cultural)

#### **Participation/Attendance (15%)**

Your participation grade will be determined by: your enthusiasm and preparation for class, the quality of your presentations, your contributions to class discussions, and how you respond to your colleagues' presentations.

#### **Educational Materials (30%)**

Students will work independently and in groups to develop two remote learning activities for use in specific non-formal settings. (Aquarium and Nature Journal)

#### **Independent Field Exploration (30%)**

As a final assignment each of you will explore a non-formal resource of interest to you. You will develop a field report about the site and create a field trip plan for this site. Guidelines for this will be posted on Google Classes. **Sites must be pre-approved by Prof. Leou.**

### **Remote Course Structure:**

Our synchronous class sessions will meet on Zoom as per our schedule on Fridays from 10:00 a.m. to 12:00 p.m. Most sessions will run for 2 hours, however, some sessions may run for 2.5 hours depending on speakers and related activities. Some sessions will include workshop components where you will work in groups on a project or activity. There will be two asynchronous sessions scheduled for the month of October. Assignments and due dates for these sessions will be posted on Google Classes.

**Synchronous Sessions:** During these sessions we will meet guest speakers, take behind the scenes tours, discuss readings, work in small groups, and hear student presentations.

September 2020

**Asynchronous Sessions:** During asynchronous sessions you will work independently. This will require online research, interviews, and some field work if it is safe and practical to do so. The assignments will enable you to choose your own concepts or topics in designing innovative educational materials that may incorporate virtual elements as well as site specific activities. The materials you develop will be presented in class sessions.

### **Course Norms:**

1. Participation: We have much to discuss as we all navigate the world during this challenging phase of our lives. Much has changed in the way we learn and live our lives in a post-pandemic world coupled with issues of racial injustice and inequity. Throughout the course we will take a critical stance in understanding the connection between environmental issues and racial justice. We will all be learning together and your thoughts, opinions, and questions matter. Our class will be enriched through your participation in discussions where we can gain new knowledge and share ideas, experiences, and concerns.
2. Google Classroom: We will be using Google Classroom as our main classroom interface, so it's your responsibility to check it and keep up to date on what's posted.
3. Zoom: Our Zoom sessions will include many guest presenters so please mute yourself when you aren't speaking and close other interactive applications while participating in our live sessions. We may experience technical difficulties but we will do our best to support each other during our zoom meetings.
4. Preparation: Come to class prepared by reading or viewing the material assigned and generate talking points and questions that we can discuss in class. Occasionally you will be asked to bring something to class or complete an assignment before coming to class. Come prepared so that you can fully participate in the activities. Note: Because we may have students in different time zones, each session will be recorded and made available to all for viewing.

### **Steinhardt School of Culture, Education and Human Development Grading Scale**

**There is no A+**

**A 93-100**

**A- 90-92**

**B+ 87-89**

**B 83-86**

**B- 80-82**

September 2020

C+ 77-79

C 73-76

C- 70-72

D+ 65-69

D 60-64

There is no D-

F Below 60

IP Incomplete/Passing

### Course Schedule 2020:

September 4 Welcome! Community Field Trip

September 11 Waste and Recycling in NYC – SIMS and DSNY

September 18 Community Science Using iNaturalist

September 25 Marine Habitats and Ocean Conservation –NY Aquarium

October 2 Field Station, Black Rock Forest Consortium

October 9 Outdoor Education for Young Learners – Queens Botanic Garden

October 16 Gardens as Outdoor Classrooms – Asynchronous

October 23 Makerspaces: Design, Make and Play - NYSci

October 30 Independent Site Visit –Asynchronous

November 6 Presentations –Virtual Trip to Monterey Bay Aquarium, Upcycling

November 13 Alternative Energy and Climate Change –Solar One

November 27 No Class – Thanksgiving Holiday Weekend

December 4 Nature Journal Presentations

December 11 Independent Field Trip Presentations

### Required Readings:

[Billig, S. \(2000\). Research on K-12 school-based service-learning: The evidence builds. \*Phi Delta Kappan\*, 658.](#)

[Gay, G. \(2002\). Preparing for culturally responsive teaching. \*Journal of teacher education\*, 53\(2\), 106-116.](#)

September 2020

Kimmerer, Robin Wall. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. Canada: Milkweed Editions, 2013.

[Wlodkowski, R. J., & Ginsberg, M. B. \(1995\). A Framework for Culturally Responsive Teaching. \*Educational Leadership\*, 53\(1\), 17-21.](#)

Russ, A., & Krasny, M. E. (Eds.). (2017). *Urban environmental education review*. Cornell University Press. (Chapter 12: Non-formal Learning)

### **Recommended Readings:**

Leou, M. (2005) *Readings in Environmental Education: An Urban Model*, Kendall Hunt, IA.

Miele, E. and Adams, J. (2010) *Science Safaris in New York City: Informal Science Expeditions for Children*, Kendall Hunt, IA.

O'Brien, Liz, Learning Outdoors: The Forest School Approach *Education 3-13*, v37 n1 p45-60 Feb 2009, *International Journal of Primary, Elementary and Early Years Education* .

Rubin, Laurie, (2013) *To Look Closely: Science and Literacy in the Natural World*, Stenhouse Publishers Portland, ME.

Sobel, David, (2004) *Place-Based Education: Connecting Classrooms & Communities*, Orion Society, Barrington, MA.

*Urban Environmental Education Review*, Russ and Krasny (ed), 2017, Cornell University Press.

[Green Girls: How a Science Program Teaches Girls to Stop Doubting Themselves](#)

### **Videos:**

[UEER Chapter 12. Non formal Learning](#)

### **Non Formal Sites and Organizations (additional links are listed in Schedule)**

- [American Museum of Natural History](#)
- [Alice Austen Historic House](#)
- [Bronx Green Up](#)
- [Brooklyn Botanic Garden](#)
- [Environmental Education Advisory Council](#)
- [New York Botanical Garden](#)
- [SIMS Municipal Recycling](#)
- [Solar One](#)
- [The River Project](#)
- [The Hudson River Park Trust](#)
- NYU [Wallerstein Collaborative for Urban Environmental Education and Sustainability](#)

September 2020

- [Queens Botanical Garden](#)

### **Apps to Explore and Use**

iNaturalist

Seek

Leaf Snap

Padlet

### **Conferences/ Events:**

#### **NYC Watershed Virtual Tour for Non-formal Educators**

Non-formal educators are invited to join DEP for a free virtual tour of the New York City watershed and water supply system on Friday, October 30, 2020 from 9:30 am – 1:30 pm. We are excited to offer this opportunity in collaboration with the Watershed Agricultural Council (WAC), and feature live presentations from WAC and DEP experts in the field. This tour has been designed as a professional learning opportunity for non-formal educators to help create, enhance, and implement lessons and activities for students about the New York City water supply system, ongoing infrastructure projects, watershed forestry and agriculture programs, and water quality monitoring. Space is limited. Register here: [NYC Watershed Virtual Tour for Non-formal Educators](#).

#### **Environmental Education Advisory Council (EEAC) Annual Meeting All are welcome!**

This year the annual meeting will be held virtually and the focus will be on climate change education.

#### **A Day In The Life of the Hudson River Date: Thursday, October 22nd**

Each autumn, thousands of students from New York City to Troy participate in the annual "A Day in the Life of the Hudson River" event. Students collect scientific information to create snapshots of the river at dozens of locations, then share their data using Web-based technology so they can better understand how their piece of the river fits into the larger Hudson estuary ecosystem. Sponsored by DEC's Hudson River Estuary Program and produced with assistance from the Lamont-Doherty Earth Observatory of Columbia University, Day in the Life coincides with National Estuaries Day and World Water Monitoring Day. <http://www.dec.ny.gov/lands/47285.html>  
<https://www.ldeo.columbia.edu/edu/k12/snapshotday/>

### **Other Policies:**

Accommodations for NYU Students with Disabilities

Any student attending NYU who needs an accommodation due to a chronic, psychological, visual, mobility and/or learning disability, or is Deaf or Hard of Hearing should register with the Moses Center for Students with Disabilities at 212-998-4980, 240 Greene St., [www.nyu.edu/csd/](http://www.nyu.edu/csd/)

Syllabus

September 2020

While some portions of the syllabus are non-negotiable, it should be considered a working document that may adjust to fit the needs of the class community, of which we are all members. You will be alerted in person and/or via NYU Classes as changes are made.

### Attendance Policy

Attendance is expected in this course. Material is presented in class that is unavailable in assignment readings. There are no texts or notes that can substitute for the discussion and interaction that will take place in class. Please be on time. You are responsible for turning in assignments when they are due and for knowing information announced in the class, whether you were present or not. It is your responsibility to obtain handouts, assignments, and information you missed when you are absent.

The following is adapted from the NYU Steinhardt Student's Guide (p. 24) and from the policies and Procedures of the NYU Expository Writing Program:

The relationship between students and faculty is the keystone of the educational experience in the Steinhardt School at New York University. This relationship takes an honor code for granted. Mutual trust, respect, and responsibility are foundational requirements. Thus, how you learn is as important as what you learn. A University education aims not only to produce high quality scholars but also to cultivate honorable citizens.

### Academic integrity

Academic integrity is the guiding principle for all that you do; from taking exams, making oral presentations, to writing term papers. It requires that you recognize and acknowledge information derived from others, and take credit only for ideas and work that are yours. You violate the principle of academic integrity when you:

- Cheat on an exam;
- Submit the same work for two or more different courses without the knowledge and the permission of all professors involved;
- Receive help on a take-home examination that calls for independent work;
- "Collaborate" with other students who then submit the same paper under their individual names.
- Give permission to another student to use your work for a class.
- Plagiarize.

### Plagiarism

Plagiarism is one of the gravest forms of academic dishonesty in university life, whether intended or not, is academic fraud. In a community of scholars, whose members are teaching, learning, and discovering knowledge, plagiarism cannot be tolerated. Plagiarism is failure to properly assign authorship to a paper, a document, an oral presentation, a musical score, and/or other materials, which are not your original work. You plagiarize when, without proper attribution, you do any of the following:

September 2020

- Copy verbatim from a book, an article, or other media;
- Download documents from the Internet;
- Purchase documents;
- Report from others' oral work;
- Paraphrase or restate someone else's facts, analysis, and/or conclusions;
- Copy directly from a classmate or allow a classmate to copy from you.

For a very helpful self-test on what constitutes plagiarism, please visit

<http://www.indiana.edu/~istd/practice.html>