

KBCC Ecology Spring 2022

**Lect.:** Remote Narrated PowerPoint, Videos & Discussion

**Lab:** In-person Lab Investigations and Field Trips

**Office Hours:** Wed. & Thurs. 12 – 12:40pm in person or via BB Collaborate (and by appointment)

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## **Biology 5300: Ecology** **Hybrid, Civic Engagement and Writing Intensive**

This 4 credit 6 hour laboratory course is an **elective** for **biology majors** who are interested in studying local ecosystems. Ecology is the study of interactions between organisms and their environment. It entails study of the structure, function and interactions of populations, communities, ecosystems, and the flow of energy and cycling of nutrients therein. Human impacts on and remediation of these systems will also be examined.

**FORMAT:** This course will be taught as a **hybrid**, so we only meet for **lab in person**. All labs will entail **outdoor** activities and/or local **field trips** (Plumb Beach, Coney Island Aquarium, Prospect Park Zoo, Brooklyn Botanic Garden, American Museum of Natural History, Central Park, The Met, etc.) **Lectures are online** and include narrated PowerPoints, discussion threads, videos, and student presentations. Students will engage in active learning, generating and testing hypotheses and reporting your findings.

### **Writing Intensive Course**

*This course meets the college's writing intensive graduation requirement.* This class is built around the premise that writing is less about what the product *is* or looks like, but what the process of writing *does* for the writer. That is, the process helps writers discover ideas in and about texts (generative writing) and make sense of their own thinking as it becomes increasingly more complex and as they move deeper into their course reading (explorative writing). Therefore, much of your learning about the texts for this course will happen during your own writing process, through a myriad of informal and formal writing assignments.

**CUNY Writing Fellows:** Because you are enrolled in a writing-intensive course, you have access to the CUNY Writing Fellows in the Center for Academic Writing Success. These Writing Fellows are a small group of Ph.D. students from the CUNY Graduate Center, here, in part, to support Kingsborough students enrolled in writing-intensive courses by serving as expert readers who also happen to know a good deal about the kind of writing that will be most valued in college-level courses. Their philosophy is that ALL writers need another set of eyes to read their papers—from the most novice writers to professionals. Why? Because reading our own writing as though we are someone else is an extraordinarily difficult feat (one that is never quite achievable), and tutoring allows students to learn how a reader is interpreting their thinking as it is displayed through their writing. Don't worry if the Writing Fellows are studying something different from you; they can help with any paper in any discipline. So bring drafts of your course papers or assignments, and you can work together to make sure that what you say best represents your thinking

**ETIQUETTE:** Please maintain a respectful and collaborative learning environment. Plagiarism (e.g. copying text or ideas as though they are your own EVEN when cited) and/or cheating will not be tolerated. Use of any electronic devices for ANY reason during tests is considered cheating. Only positive feedback and constructive interactions must be maintained at all times.

**TIPS FOR SUCCESS:** Log in each week and review all lecture content. Complete and submit all assignments on time and to the best of your ability. Attend or listen to recorded Q&A sessions to learn about the weekly assignments and labs. Be prepared to participate fully in all field based or trip based labs. You will be collecting field data using field based tools and techniques.

**CIVIC ENGAGEMENT:** Students will participate in multiple Citizen Science research projects which contribute data to local, regional and global species conservation efforts. These include 1. Gotham Coyote 2. Mark-Recapture of Horseshoe Crabs, 3. iNaturalist, Students who complete these projects and write a reflection of their work are eligible to receive a CE certificate and credit.

**OER TEXT:** *Essentials of Ecology* Townsend, Begon and Harper 3<sup>rd</sup> Edition Blackwell Publishing (Free PDF <https://epdf.tips/queue/essentials-of-ecology.html> )

**NO LAB MANUAL:** All labs are inquiry based and student driven.

<b>GRADES:</b>	Lab reports (10)	30%
	Discussion threads (10)	20%
	Term paper	10%
	Narrated PowerPoint	10%
	Unit tests (2)5% each	10%
	Cumulative final exam	20%
	<b>TOTAL:</b>	<b>100%</b>

**TESTS:** Two unit tests and a **final exam** will be administered online. Each test is unique and will be comprised of multiple choice questions randomly drawn from a test bank. All tests will be available for 24 hours.

**DISCUSSIONS:** The weekly discussion threads are essentially a **first draft** of each section of the term paper. These require that you relate the weekly topics to the species you are focused on for your final report. **Feedback** given each week, should therefore be integrated into **the final draft** of your term paper, which will in turn form the basis of your final narrated Power Point presentation.

**LABS:** Each week's lab will entail an active learning, inquiry based investigation of an ecological question. Students will develop and test hypotheses, collect and analyze data, then report their findings, report its meaning and relate their data to the peer literature.

**TERM PAPER:** A **four** page report must be on the **species** you selected at the start of the semester which **MUST** be approved by the professor. This is worth **10%** of your final grade.

The report must be supported by the **same** summaries of peer reviewed scientific sources used in your **discussion** posts. Each section below must be clearly indicated by the following **headings** and must contain one half page of text based on the specified citations as follows:

1. **Introduction** (**image**, physical **description** and **taxonomy** all from [www.iNaturalist.org](http://www.iNaturalist.org))
2. **Population** (one peer article on **population surveys**)
3. **Competition** (one peer article on its **interspecific** OR **intraspecific** competition)
4. **Predation** (one peer article on its **predators** AND one on its **prey**)
5. **Symbioses** (one peer article on its **parasites** AND one on **mutualists**)
6. **Community** (one peer article on its **niche**.)
7. **Habitat** (one peer article on the **natural habitat** AND/OR **introduced habitat**.)
8. **Conservation Status** ([www.iucnredlist.org](http://www.iucnredlist.org) status, threats, laws and population trends)

**Literature Cited:** All articles/sources referenced in the report must be alphabetically listed at the end as follows (basically APA format)

1<sup>st</sup> author last name, first initial, 2<sup>nd</sup>, 3<sup>rd</sup>, etc. (year). Title of article. *Name of Journal*. Issue/Volume: Page #s.

This report must be typed in 12 point font, 1.5 spacing and saved as a Word doc. The literature section must be at the end. Pages must be numbered clearly. No cover page. No images or charts. ALL literature sources must be referenced in the paper by 1<sup>st</sup> author's last name and year (Jones, 2001, Jones and Jones, 2020 or Jones et al. 2020). This report must include **eight** valid scientific sources along with a URL link to the article. The title of your report must include the common and scientific name and must be descriptive of the organism. In the body of the report, you may use an abbreviated version of the scientific binomial instead of the common name eg Malay Civet (*Viverra zibetha*) now becomes *V. zibetha*.

**ORAL PRESENTATION:** A 10 minute, 10 slide narrated PowerPoint presentation based on your term paper will be made by each student during the final week. This will count as an additional 10% of your grade and must be narrated by you. The file name must include the name of the presenter and the species common name. Presentations must use 24 pt. font, high contrast, clear images and bulleted talking points. Each slide must have the same titles as specified above plus a title slide and a references. The presentation must contain a title page with the title of presentation, correct common and scientific species name, and name of the presenter. Each slide should have a relevant image of the topic (eg phylogeny, competitors, predators, prey, parasites, range map etc.).

**EXTRA CREDIT:** One point of extra credit up to 5 points (5% of the final grade) will be given for each lecture/event attended and summarized during the semester.

## TOPICS COVERED AND ASSIGNMENTS EACH WEEK

- Mar 7           **Lecture 1:** Chapter 1- Introduction   **Discussion 1:** Video introductions and species selection  
Mar 9           **Lab 1: GOTHAM COYOTE** Campus Computer Lab (Citizen Science)  
**Meet in S-226** then move to nearby Computer Lab
- Mar 14          **Lecture 2:** Chapter 5 - Populations   **Discussion 2:** Summarize peer article on populations  
Mar 16          **Lab 2: SNAIL MARK RECAPTURE**  
**Meet in S-226** then move outside to the tidal flats
- Mar 21          **Lecture 3:** Chapter 7 Predation   **Discussion 3:** Summarize peer article on predation  
Mar 23          **Lab 3: CAMPUS BEACH** Evidence of Gull Predation  
**Meet in S-226** then move outside to campus perimeter and parking lots to collect data
- Mar 28          **Lecture 4:** Chapter 6 Competition   **Discussion 4:** Summarize peer article on competition  
Mar 30          **Lab 4: CAMPUS PERRIMETER** Evidence of Bird Competition with scan sampling  
**Meet in S-226** then move to KCC Marina, Beach and Manhattan beach to collect data
- Apr 4           **Lecture 5:** Chapter 8 Parasitism and Mutualism **TEST 1**   **Discussion 5:** Summarize symbiosis  
Apr 6           **Lab 5: CAMPUS EPIBIONTS** on Oysters and/or Horseshoe Crabs  
**Meet in S-226** then move to Marina/RV-CUNY 1 boat outside T3 to collect data
- Apr 11          **Lecture 6:** Chapter 9 Communities   **Discussion 6:** Summarize peer literature on niches  
Apr 13          **Lab 6: CAMPUS TREE PHENOLOGY** **Meet in S-226** then move to trees in front of Library
- APR 15          *SPRING BREAK*
- Apr 25          **Lecture 7:** Chapter 4.1 Terrestrial Ecosystems   **Discussion 7:** Summarize peer article on biome  
Apr 27          **Lab 7: AMERICAN MUSEUM OF NATURAL HISTORY**  
**Meet** at main entrance to museum on CPW at 79<sup>th</sup> Street
- May 2           **Lecture 8:** Chapter 4.4 Aquatic Ecosystems   **Discussion 8:** Summarize iNaturalist marine taxa  
May 4           **Lab 8: CONEY ISLAND AQUARIUM** Shark Exhibit Shark Ethogram  
**Meet** at entrance to Aquarium
- May 9           **Lecture 9:** Chapter 14 Conservation   **Discussion 9:** Summarize IUCN conservation status  
May 11          **Lab 9: BRONX or PROSPECT PARK ZOO** Which trophic role is most endangered?  
**Meet** at Asia Gate (A) of Bronx Zoo
- May 16          **Lecture 10:** Chapter 10 Biodiversity **TEST 2**   **Discussion 10:** Literature review  
May 18          **Lab 10: BROOKLYN BOTANIC GARDEN** Biodiversity comparison of desert and rainforest  
**Meet** at Eastern Parkway Entrance to Botanic Garden
- May 23          **Lecture 11** Field Ecology and Civic Engagement **Discussion 11:** Summary Botton et al. (2017)  
May 25          **Lab 11: PLUMB BEACH** Horseshoe Crab survey and tagging  
**Meet** at entrance to KCC campus or at Plumb Beach parking lot
- May 30          **Lecture 12:** Horseshoe Crab Research   **Discussion 12:** Civic Engagement reflections  
June 1          **Lab 12: PLUMB BEACH** Horseshoe Crab survey and tagging  
**Meet** at entrance to KCC campus or at Plumb Beach parking lot

## MEASURABLE LEARNING OUTCOMES

1. Apply **methods** and processes of life science by designing, conducting and writing up scientific investigations.
2. Demonstrate proficiency in **quantitative** reasoning by analyzing, depicting, interpreting and comparing data.
3. Compare and contrast **evolutionary adaptations** of organisms under various environmental and ecological conditions.
4. Demonstrate an understanding of the **pathways of energy** transfer and matter cycling within living systems by constructing trophic pyramids, food webs and nutrient cycles.
5. Demonstrate an understanding of the **levels of biological organization** and interactions by describing different types of ecological interactions between individuals in populations, communities, and ecosystems.

### LEARNING COMPETENCIES

### ACTIONS TO MEET THESE

Become civically engaged

Contribute to iNaturalist & Gotham Coyote

Develop scientific literacy

Search, read & summarize the peer literature

Understand scientific methods

Conduct independent research investigations

Develop public speaking skills

Present research findings to your peers

Develop scientific writing skills

Craft a well written term paper

Become proficient in PowerPoint

Prepare and deliver a narrated PowerPoint

Become proficient in MS Word

Create a written term paper using MS Word

Become proficient in MS Excel

Manipulate data tables and graphs in Excel

Develop classification skills

Classify local organisms to the correct taxa

Develop identification skills

Use iNaturalist to ID local species

Understand trophic roles

Create a trophic pyramid and food web

Use descriptive statistics

Statistically summarize data sets

Conduct mathematical calculations

Estimate populations & species diversity

Understand human impacts

Conduct research on environmental issue

Differentiate between ecosystems

Compare physical and biological differences

Differentiate between global biomes

Compare local and global biomes

Understand animal behavior

Use an ethogram to observe fish behavior

Conduct biodiversity censuses

Survey local organisms in iNaturalist