COLUMBIA UNIVERSITY
School of Professional Studies

**Master of Science in Sustainability Management**

# The Science of Urban Ecology (PS4235)
# Mondays 6:10-8:00pm
# 3 Credits


**Instructor:** Dr. Amy Karpati; ask2197@columbia.edu
**Office Hours:** Mondays 5:30-6:00pm, or by appointment
**Response Policy:** Students can generally expect a response to emails within 24 hours, seven days a week.

**Teaching Assistant:** Sarah Guan; sg4059@columbia.edu
**Office Hours:** TBD
**Response Policy:** TBD


## Course Overview

This course facilitates learning about 1) basic principles related to ecological interactions of life on Earth, 2) the causes and consequences of ecological patterns and processes in urban environments, and 3) how ecology can inform sustainability decision-making in cities.

This course addresses the physical dimensions of sustainability management and the connections between the natural and built environments. The beginning of the course offers a brief overview of ecology and ecosystems – both urban and non-urban. This is followed by an in-depth exploration of urban nature, ecosystem services, conservation of urban biodiversity, and best practices for applying lessons from nature to our own pursuit of sustainability. This course aims to provide students with an understanding of the ways in which ecological perspectives can contribute to an interdisciplinary approach to solving environmental problems facing human society, particularly in the urban environment.

Towards that end, this course covers topics ranging from applied ecology and conservation biology to sustainable development. It uses a cross-disciplinary approach to understand the nature of ecology and biological conservation as well as the social, philosophical, and economic dimensions of land use strategies. Although in some ways cities may seem to be isolated from what we would otherwise call "nature," they are not, and this is a major theme of this course. We will discuss ecosystem function, evolutionary processes, biodiversity, nutrient cycling, and ecosystem service valuation in cities. Additionally, we will explore the latest ideas and strategies for improving ecological functioning and biodiversity in urban environments such as green infrastructure and nature-based solutions.

This course is an on-campus elective offered during the Spring semester and fulfills 3 credits within the Physical Dimensions of Sustainability Management curriculum area in the Master of Science in Sustainability Management program. Cross-registration is available to students outside of the Master of Science in Sustainability Management program, space permitting.

## Learning Objectives

Upon successful completion of this course, students should be able to:

- L1 - Evaluate cities as ecosystems and describe how they are both similar to and different from non-urban ecosystems.
- L2 - Articulate the basics of ecology, biodiversity, and the value of ecosystem services we rely upon.
- L3 - Identify patterns and processes of urban ecosystems, evaluate threats to urban nature, and incorporate principles of urban ecology into human well-being and sustainability.
- L4 - Apply an optimistic outlook on urban environments through knowledge about how to better integrate biodiversity and ecosystem services into cities.
- L5 - Analyze, design, and apply green infrastructure and nature-based solutions to address environmental and sustainability issues in cities.



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- L6 - Recognize and analyze the relationships among the scientific, social, and economic issues that shape urban ecosystems
- L7 - Incorporate ecological research and scientific theory into urban sustainability planning and practice.

## Readings

All readings are available through the course Canvas website.

**Text:**

Marris, E. (2011). Rambunctious Garden: Saving Nature in a Post-Wild World. Bloomsbury USA, New York, NY

**Required Readings:**

Aronson, M.F.J., La Sorte, F.A., Nilon, C.H., Katti, M., Goddard, M.A., Lepczyk, C.A., Warren, P.S., Williams, N.S.G.,Cilliers, S., Clarkson, B., Dobbs, C., Dolan, R., Hedblom, M., Klotz, S., Kooijmans, J.L., Kuhn, I., MacGregor-Fors, I., McDonnell, M., Mörtberg, U., Pysek, P., Siebert, S., Sushinsky, J., Werner, P., & Winter, M. (2014). A global analysis of the impacts of urbanization on bird and plant diversity reveals key anthropogenic drivers. *Proceedings of the Royal Society B, 281*, 20133330.

Aronson, M.F.J., Lepczyk, C.A., Evans, K.L., Goddard, M.A., Lerman, S.B., MacIvor, J.S., Nilon, C.H., & Vargo, T. (2017). Biodiversity in the city: key challenges for urban green space management. *Frontiers in Ecology and the Environment, 15*, 189-196.

Black, K.J., & Richards, M. (2020). Eco-gentrification and who benefits from urban green amenities: NYC's High Line. *Landscape and Urban Planning, 204,* 103900.

Bowen, J.L. & I. Valiela, I. (2001). The ecological effects of urbanization on coastal watersheds: historical increases in nitrogen and eutrophication of Waquoit Bay estuaries. *Canadian Journal of Fisheries and Aquatic Sciences, 58,* 1489-1500.

Cardinale, B.J., Duffy, J.E., Gonzalez, A., Hooper, D.U., Perrings, C., Venail, P., Narwani, A., Mace, G.M., Tilman, D., Wardle, D.A., Kinzig, A.P., Daily, G.C., Loreau, M., Grace, J.B., Larigauderie, A., Srivastava, D.S., & Naeem, S. (2012). Biodiversity loss and its impact on humanity. *Nature*, *486,* 59-67.

Churkina, G. (2008). Modeling the carbon cycle of urban systems. *Ecological Modelling, 216,* 107-113.

Del Tredici, P. (2010). Wild Urban Plants of the Northeast: A Field Guide. Cornell University Press, Ithaca, NY.

Ellis, E.C., & Ramankutty, N. (2008). Putting people in the map: anthropogenic biomes of the world. *Frontiers in Ecology and the Environment, 6,* 439-447.

Elmqvist, T., Setälä,, H. Handel, S.N., van der Ploeg, S., Aronson, J., Blignaut, J.N., Gómez-Baggethun, E., Nowak, D.J., Kronenberg, J., & de Groot, R. (2015). Benefits of restoring ecosystem services in urban areas. *Current Opinion in Environmental Sustainability, 14,* 101-108.

Francis, R.A., & J. Lorimer, J. (2011). Urban reconciliation ecology: The potential of living roofs and walls. *Journal of Environmental Management, 92,*1429-1437.

Gómez-Baggethun, E., & Barton, D.N. (2013). Classifying and valuing ecosystem services for urban planning.



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https://www.wiley.com/en-us/The+Course+Syllabus%3A+A+Learning+Centered+Approach%2C+2nd+Edition-p-9780470605493

*Ecological Economics, 86,* 235-245.

Hobbs, R.J., Higgs, E., & Harris, J.A. (2009). Novel ecosystems: implications for conservation and restoration. *Trends in Ecology & Evolution, 24,* 599-605.

Hobbs, R.J., Higgs, E., Mall, C.M., Bridgewater, P., Chapin III, F.S., Ellis, E.C., Ewel, J.J., Hallett, L.M., Harris, J., Hulvey, K.B., Jackson, S.T., Kennedy, P.L., Kueffer, C., Lach, L., Lantz, T.C., Lugo, A.E., Mascaro, J., Murphy, S.D., Nelson, C.R., Perring, M.P., Richardson, D.M., Seastedt, T.R., Standish, R.J., Starzomski, B.M., Suding, K.N., Tognetti P.M., Yakob, L., & Yung, L. (2014). Managing the whole landscape: historical, hybrid, and novel ecosystems. *Frontiers in Ecology and the Environment, 12,* 557-564.

Hooper, D.U., Adair, E.C., Cardinale, B.J., Byrnes, J.E., Hungate, B.A., Matulich, K.L., Gonzalez, A., Duffy, J.E., Gamfeldt, L., & O'Connor, M.I. (2012). A global synthesis reveals biodiversity loss as a major driver of ecosystem change. *Nature*, *486*(7401), 105–108.

Jansson, A. (2013). Reaching for a sustainable, resilient urban future using the lens of ecosystem services. *Ecological Economics, 86,* 285-291.

Kueffer, C., & Kaiser-Bunbury, C.N. (2014). Reconciling conflicting perspectives for biodiversity conservation in the Anthropocene. *Frontiers in Ecology and the Environment, 12,* 131-137.

LaNier, R. (1975). Developing an ecological framework for the planning of human settlements. *Urban Ecology 1,* 1-4.

Lovell, S.T., & Taylor, J.R. (2013). Supplying urban ecosystem services through multifunctional green infrastructure in the United States. *Landscape Ecology, 28,* 1447-1463.

Luniak, M. (2004). Synurbanization – adaptation of animal wildlife to urban development. Pgs 50-55 in Shaw, W.W., L.K. Harris, and L. Vandruff, Eds. Proceedings of the 4th International Urban Wildlife Symposium. School of Natural Resources, College of Agriculture and Life Science, University of Arizona, Tucson, AZ.

Mackay, C.M.I., & Schmitt, M.T. (2019). Do people who feel connected to nature do more to protect it? A meta-analysis. *Journal of Environmental Psychology, 65,* 101323.

Marris, E. (2011). Rambunctious Garden: Saving Nature in a Post-Wild World. Bloomsbury USA, New York, NY.

McKinney, M.L. (2006). Urbanization as a major cause of biotic homogenization. *Biological Conservation, 127,* 247-260.

Miller, J.R. (2005). Biodiversity conservation and the extinction of experience. *TRENDS in Ecology and Evolution, 20*, 430-434.

Nilon, C.H., Aronson, M.F.J, Cilliers, S.S., Dobbs, C., Frazee, L.J., Goddard, M.A., O'Neill, K.M., Roberts, D., Stander, E.K., Werner, P., Winter, M., & Yocom, K.P. (2017). Planning for the future of urban biodiversity: A global review of city-scale initiatives. *BioScience, 67,* 332-342.

Ozer, E. (2014). Mutualistic relationships versus hyper-efficiencies in the sustainable building and city. *Urban Ecosystems, 17,* 195-204.

Paul, M.T., & Meyer, J.L. (2001). Streams in the urban landscape. *Annual Review of Ecology and Systematics, 32,* 333-365.

Rees, W., & Wackernagel, M. (1996). Urban Ecological Footprints: Why cities cannot be sustainable – and why they are a key to sustainability. *Environmental Impact Assessment Review, 16,* 223-248.

Ring, I., Hansjürgens, B., Elmqvist, T., Wittmer, H., & Sukhdev, P. (2010). Challenges in framing the economics of ecosystems and biodiversity: the TEEB initiative. *Current Opinion in Environmental Sustainability, 2,* 15-26.

Rowland-Shea, J., Doshi, S., Edberg, S., & Fanger, R. (2020). The Nature Gap: Confronting racial and economic disparities in the destruction and protection of Nature in America. Center for American Progress. Washington, DC.

Schell, C.J., Dyson, K., Fuentes, T.L., Des Roches, S., Harris, N.C., Miller, D.S., Woelfle-Erskine, C.A., & Lambert, M.R. (2020). The ecological and evolutionary consequences of systemic racism in urban environments. *Science, 369,* 6510.

Shafique, M., Xue, X., & Luo, X. (2020). An overview of carbon sequestration of green roofs in urban areas. *Urban Forestry & Urban Greening, 47,* 126515.

Spirn, A.W. (1984). The Granite Garden. Basic Books, New York, NY, USA.

Standish, R.J., Hobbs, R.J. & Miller, J.R. (2013). Improving city life: options for ecological restoration in urban landscapes and how these might influence interactions between people and nature. *Landscape Ecology, 28,* 1213-1221.

Steffen, W., Richardson, K., Rockström, J., Cornell, S.E., Fetzer, I., Bennett, E.M., Biggs, R., Carpenter, S.R., de Vries, W., de Wit, C.A., Folke, C., Gerten, D., Heinke, J., Mace, G.M., Persson, L.M., Ramanathan, V., Reyers, B., & Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science, 347,* 1259855.

Wu, J. (2014). Urban ecology and sustainability: The state-of-the-science and future directions. *Landscape and Urban Planning, 125,* 209-221.

Zuniga-Teran, A.A., Gerlak, A.K., Elder, A.D., & A. Tam, A. (2021). The unjust distribution of urban green infrastructure is just the tip of the iceberg: A systematic review of place-based studies. *Environmental Science and Policy, 126,* 234-245.

**Recommended Readings:**

Aloisio, J.M., Palmer, M.I., Tuininga A.R., & Lewis, J.D. (2019). Plant colonization of green roofs is affected by composition of established native plant communities. *Frontiers in Ecology and the Environment, 6,* 00238.

Axon, S. (2017). "Keeping the ball rolling": Addressing the enablers of, and barriers to, sustainable lifestyles. *Journal of Environmental Psychology, 52*, 11-25.

Bee, M.A., & Swanson, E.M. (2007). Auditory masking of anuran advertisement calls by road traffic noise. *Animal Behaviour, 74,* 1765-1776.

Beier, et al. (2007). Conceptual steps for designing wildlife corridors. CorridorDesign. http://corridordesign.org/dl/docs/ConceptualStepsForDesigningCorridors.pdf

Borysiak, J., Mizgajski, A., & Speak, A. (2017). Floral biodiversity of allotment gardens and its contribution to urban green infrastructure. *Urban Ecosystems, 20,* 323-335.

Botzat, A., Fischer, L.K., & Kowarik, I. (2016). Unexploited opportunities in understanding liveable and biodiverse cities. A review on urban biodiversity perception and valuation. *Global Environmental Change, 39,* 220-233.

Bray, N. & Wickings, K. (2019).The roles of invertebrates in the urban soil microbiome. *Frontiers in Ecology and Evolution, 7,* 00359.

Chapin III, F.S., Zavaleta, E.S., Eviner, V.T., Naylor, R.L., Vitousek, P.M., Reynolds, H.L., Hooper, D.U., Lavorel, S., Sala, O.E., Hobbie, S.E., Mack, M.C., & Diaz, S. (2000). Consequences of changing biodiversity. *Nature, 405,* 234-242.

Clevenot, L., Carré, C., & Pech, P. (2018). A review of the factors that determine whether stormwater ponds are ecological traps and/or high-quality breeding sites for amphibians. *Frontiers in Ecology and Evolution, 6,* 00040.

Colla, S.R., Willis, E., & Packer, I. (2009). Can green roofs provide habitat for urban bees (Hymenoptera: Apidae)? *Cities and the Environment, 2,* 1-12.

Department for Environment, Food and Rural Affairs. (2007). An introductory guide to valuing ecosystem services. Defra Publications, London, UK.

Ellis, E.C., Antill, E.C., & Kreft, H. (2012). All is not loss: Plant biodiversity in the Anthropocene. *PLoS ONE, 7,* e30535.

Francis, R.A. (2010). Wall ecology: A frontier for urban biodiversity and ecological engineering. *Progress in Physical Geography, 35,* 43-63.

Hamer, A.J., Smith, P.J., & McDonnell, M.J. (2012). The importance of habitat design and aquatic connectivity in amphibian use of urban stormwater retention ponds. *Urban Ecosystems, 15,* 451-471.

Ives, C.D., Lentini, P.E., Threlfall, C.G., Ikin, K., Shanahan, D.F., Garrard, G.E., Bekessy, S.A., Fuller, R.A., Mumaw, L., Rayner, L., Rowe, R., Valentine, L.E., & Kendal, D. (2015). Cities are hotspots for threatened species. *Global Ecology and Biogeography*, *25*(1), 117–126.

Kaye, J.P., Groffman, P.M., Grimm, N.B., Baker, L.A., & Pouyat, R.V. (2006). A distinct urban biogeochemistry? *TRENDS in Ecology and Evolution, 21,* 192-199.

Klem Jr., D. (2009). Avian mortality at windows: the second largest human source of bird mortality on Earth. Proceedings of the 4th International Partners in Flight Conference , 13-16 February 2008. Ed. T. D. Rich, C. Arizmendi, D. Demarest, and C. Thompson McAllen, Texas, USA. Partners in Flight, USDA, Forest Service Technical Report, 2009.

Ksiazek-Mikenas, K., Fant, J.B., & Skogen, K.A. (2019). Pollinator-mediated gene flow connects green roof populations across the urban matrix: A paternity analysis of the self-compatible forb *Penstemon hirsutus*. *Frontiers in Ecology and Evolution, 7,* 00299.

Lepczyk, C.A., Aronson, M.F., Evans, K.L., Goddard, M.A., Lerman, S.B., & MacIvor, J.S. (2017). Biodiversity in

the city: Fundamental questions for understanding the ecology of urban green spaces for biodiversity conservation. *BioScience*, *67*(9), 799–807

Li, E., Parker, S.S., Pauly, G.B., Randall, J.M., Brown, B.V., & Cohen, B.S. (2019). An urban biodiversity assessment framework that combines an urban habitat classification scheme and citizen science data. *Frontiers in Ecology and Evolution, 7,* 00277.

Lundholm, J.T., & Richardson, P.J. (2010). Habitat analogues for reconciliation ecology in urban and industrial environments. *Journal of Applied Ecology, 47,* 966-975.

Martin, C., & Czellar, S. (2017). Where do biospheric values come from? A connectedness to nature perspective. *Journal of Environmental Psychology, 52,* 56-68.

Matteson, K.C., Ascher, J.S., & Langellott, G.A. (2008). Bee richness and abundance in New York City urban gardens. *Annals of the Entomological Society of America, 101,* 140-150.

McDonnell, M.J., & Hahs, A.K. (2013). The future of urban biodiversity research: Moving beyond the 'low-hanging fruit.' *Urban Ecosystems, 16,* 397-409.

McEwan, K., Ferguson, F.J., Richardson, M., & Cameron, R. (2020). The good things in urban nature: A thematic framework for optimizing urban planning for nature connectedness. *Landscape and Urban Planning, 194,* 103687.

McGregor, M., Matthews, K., & Jones, D. (2017). Vegetated fauna overpass disguises road presence and facilitates permeability for forest microbats in Brisbane, Australia. *Frontiers in Ecology and Evolution, 5,* 00153.

Milbrath, L.W. (1995). Psychological, Cultural, and Informational Barriers to Sustainability. *Journal of Social Issues, 51,* 101-120.

Miller, J.R., & Hobbs, R.J. (2002). Conservation where people live and work. *Conservation Biology, 16,* 330-337.

NATURA Environmental Consultants, & O'Connor, D. (2008). Green City Guidelines. UCD Urban Institute Ireland, Dublin, Ireland.

Neil, K., & Wu, J. (2006). Effects of urbanization on plant flowering phenology: A review. *Urban Ecosystems, 9,* 243-257.

Odell, E.A., Theobald, D.M., & Knight, R.L. (2003). Incorporating ecology into land use planning: the songbirds' case for clustered development. *Journal of the American Planning Association, 69,* 72-82.

Pimm, S.L., & Raven, P. (2000). Biodiversity: Extinction by numbers. *Nature, 403*, 843-845.

Rosenzweig, M.L. (2003). Win-Win Ecology: How the Earth's Species Can Survive in the Midst of Human Enterprise. Oxford University Press, Inc., New York, NY, USA.

Rudd, H., Vala, J., & Schaefer, V. (2002). Importance of backyard habitat in a comprehensive biodiversity conservation strategy: A connectivity analysis of urban green spaces. *Restoration Ecology, 10,* 368-375.

Schilthuizen, M. (2016). Evolution is happening faster than we thought. The New York Times. https://www.nytimes.com/2016/07/24/opinion/sunday/evolution-is-happening-faster-than-we-thought.html

Staudinger, M.D. et al. (2013). Biodiversity in a changing climate: A synthesis of current and projected trends in the US. *Frontiers in Ecology and the Environment, 11*(9), 465-473.

Suárez-Rodríguez, M., Montero-Montoya, R.D., & Garcia, C.M. (2017). Anthropogenic nest materials may increase breeding costs for urban birds. *Frontiers in Ecology and Evolution, 5,* 00004.

Taft, D. (2015). Wild in the streets: A 24-hour field guide to New York City. The New York Times. https://www.nytimes.com/interactive/2015/07/03/nyregion/A-24-Hour-Field-Guide-to-New-York-City.html

Tanner, C.J., Adler, F.R., Grimm, N.B., Groffman, P.M., Levin, S.A., Munshi-South, J., Pataki, D.E., Pavao-Zuckerman, M., & Wilson, W.G. (2014). Urban ecology: Advancing science and society. *Frontiers in Ecology and the Environment, 12,* 574-581.

TEEB – The Economics of Ecosystems and Biodiversity. (2011). TEEB Manual for Cities: Ecosystem Services in Urban Management.

Threlfall, C.G., & Kendal, D. (2018). The distinct ecological and social roles that wild spaces play in urban ecosystems. *Urban Forestry & Urban Greening, 29,* 348-356.

Walsh, C.J., Fletcher, T.D., & Ladson, A.R.. (2005). Stream restoration in urban catchments through redesigning stormwater systems: looking to the catchment to save the stream. *Journal of the North American Benthological Society, 24*, 690-705.

## Assignments and Assessments

Details for all assignments and assessments can be found on the course Canvas site.

**Attendance and Class Participation (15%) (L1-L7)**
Attendance is expected for each class session. If you have to miss class for any reason, please notify me by email before the start of the class session. Each unexcused absence can negatively impact your overall grade in the class. Participation in and contribution to topical class discussion is an important component of learning success in this course.

**Introduction Video and Urban Ecology Concept Map (5%) (L1)**
The goal for this assignment is both to introduce yourself to our class and to try to encapsulate your initial thinking about urban ecology at the beginning of this course.

For this video assignment, you will (1) do a brief introduction of yourself – where you are from, your pronouns if you choose, your academic/professional background, your interest in urban ecology, what you hope to learn in this course, etc., and (2) create an Urban Ecology Concept map – digitally or on paper – and share it with your classmates through your video. Please try to keep your video to 3 minutes or less.

For your concept map:

a) Complete this sentence: "Urban nature involves…."
b) List the items, concepts, and ideas that come to mind as you complete this sentence. Keywords and short phrases are best. Aim for between 10-20 ideas. Don't try to research external resources – just articulate what comes to ***your*** mind.
c) Organize your ideas around the central concept of "Urban Nature." If you choose to create your concept map on paper, you might put each phrase or concept on a post-it note or on a small piece of paper, and

organize them around your central idea of "Urban Nature." You may also simply draw your concept map, writing your phrases in bubbles that extend outward from your central idea of "Urban Nature." Alternatively, you can make a digital concept map – online resources are suggested on Canvas.

d) You can cluster your ideas about Urban Nature by similarity, hierarchy, process, or any way that makes sense to you. For example, does one concept cause another? Is one more important than others? If your ideas are equally important, then arrange your notes in a web pattern off of the central "Urban Nature." [Optional: Use verbs to connect the concepts so that your map can be understood as sentences. For example, if you connect the central concept "Urban Nature" to another concept, describe how they are related. You might link "Urban Nature" to another concept "water resources" with the descriptor "provides." Or, "Urban Nature" → "contains → "rats."]
e) Present your map. After telling us about yourself, share your concept map in your video. If your map is digital, you can use the online video recording tool Screencast-O-Matic (sign up for a free account). If your map is on paper, you can simply hold up your map to the camera as you talk us through it. Or, you can scan or take a photo of it, upload it to your computer, and present it using Screencast-O-Matic.
f) Ultimately, you will share your video with your classmates through a Discussion page on Canvas.

The Introduction Video and Urban Ecology Concept Map will be worth 50 points. Full points will be awarded to students who share a video that includes an introduction to themselves as well as a presentation of their Urban Ecology Concept Map, and who comment on the videos of four classmates for Week 3 (5 points).

Lastly, at the end of the semester, you will create another Urban Ecology Concept Map, without consulting your original map, to help you see how your thinking has (or hasn't!) changed through this course. You will not need to create a video for this final map – just submit your new Concept Map through Canvas along with a written paragraph about the similarities and differences, if any, between your original and final maps. The final Urban Ecology Concept Map will also be worth 50 points. Full points will be awarded to students who turn in their final Concept Map along with the written comparison to their initial Concept Map.

**Discussion Board Responses (30%) (L1-L7)**

Each week, students are expected to read all of the week's assigned readings before coming to class. For most weeks' readings, there will be an associated question posted on the Canvas Discussion Board. Please post your response to this question each week before the start of the class, and note that your response will be visible to other students. The writing prompts will ask you to draw on information you learned in the readings, but will allow for flexibility in your responses. The goal here is to try to stimulate your thinking and conduct formative assessment of your learning to date. There are no absolutely right answers, but I will be looking for evidence that you read the readings and also that you spent at least a little time thinking about the question. No need to write a full-length essay; a paragraph or two (~400-500 words) is perfectly sufficient.

We will often discuss your responses in class. Please view your classmates' responses, and come to class prepared to provide insightful feedback, refute a point, provide further relevant information, or otherwise expand your classmates' thinking. This is meant to facilitate collaboration, promote sharing of ideas, and stimulate discussion.

Each Discussion Board Question will be graded out of 15 points as follows: Relevance to Topic (5 points), in which your understanding is demonstrated through a direct reply to the prompt and further exploration relevant to the discussion topic; Quality of Effort (5 points), which is made apparent through clear writing and well-developed ideas; and Reference to the Readings (5 points), in which you cite information from the week's readings to support your response. The detailed grading rubric can be found on Canvas. Please note that 2 points will be deducted for late submissions.

**Midterm Vodcast/Podcast (20%) (L4-L7)**

The Nature of Cities (http://www.thenatureofcities.com/) is an extensive online resource for urban ecology. It features essays and roundtable discussions from many different urban ecologists, landscape architects, urban



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planners, activists, and other sustainability professionals around the world. For this assignment, you will browse through topics and essays that are of interest to you, and find an author from whom you would like to learn more. Then, make contact with that author and request to interview them for a podcast (audio only) or vodcast (audio + video) that we will post on our Canvas site.

This may seem intimidating at first, but it's a fantastic way to make connections with professionals in the field. And, most are happy to assist students interested in sustainability! As you might be aware, the process of establishing contact with an author and ultimately producing an interview can take significant time. I would suggest making contact with a number of potential interviewees early on in the course to ensure that someone will agree to work with you. If you have difficulty finding an author to interview, please let me know as soon as possible. We can always make accommodations for students who might experience significant difficulty – there are plenty of urban ecologists and sustainability professionals here in NYC (and at Columbia!) who could be options, too.

Your assignment is to conduct a brief interview (15 minutes maximum) with your author of interest and share it with our class by posting your podcast or vodcast on Canvas. Tell them what article you read on The Nature of Cities, and why it interested you. Ask them questions related to the content in their article(s) (you can ask them to elaborate on what they've already answered in their article, since the rest of us probably haven't read it) and to urban ecology/sustainability in general. What questions came to mind as you read their article? What would you like to learn more about? What do they think about enhancing urban biodiversity, or deepening city residents' connection to nature, or the best uses of green infrastructure, or case studies of successful urban sustainability projects? Ask them!

Ideally, you will post an audio podcast of you and the author in conversation, or a video vodcast of you and the author conversing via video-conferencing (or, if you get lucky, in person). BE SURE TO LET YOUR INTERVIEWEE KNOW THAT YOU WOULD LIKE TO AUDIO/VIDEO RECORD THEM AND GET THEIR PERMISSION WELL BEFORE CONDUCTING THE INTERVIEW! There are multiple ways to accomplish the recording – though Zoom is most commonly used to record a video conference between you and the author. If you are experiencing difficulty finding a good technology option, please let me know, as we can create alternatives. The point is not to give you a hard time with the process, but for you to come away with a worthwhile experience, a professional connection, and a product to show for your work.

Podcasts/vodcasts will be graded out of 100 points as follows: 20 points awarded for positive, respectful, inquisitive interaction with the author; 40 points for quality of questions and discussion; 40 points for relevance of the topic to urban ecology. The detailed grading rubric can be found on Canvas.

**Final Project (30%) (L3-L7)**

For the final course project, students will divide into teams (3-6 people per team) and follow the project prompt below. Each group's project will culminate in a 20-40 minute presentation, delivered jointly by your team during Week 14 or 15. Depending on our class enrollment, groups *may* have the option to either (1) present their work through an in-class (online) presentation, or (2) create a video presentation (i.e. Powerpoint screencast) of their work, post it to Canvas for their peers to view prior to coming to class, and come to class ready to answer classmates' questions about their presentation.

In addition to the joint presentation, each member of the team will submit a 4-8 page (12 pt Times New Roman) written brief as described below. The brief should include at least 5 citations from reliable sources.

> **Project Prompt:** Your project team represents a community Sustainability Advisory Board – a group of individuals who advocate for urban environmental conservation and sustainable development in the community. The Sustainability Advisory Board makes recommendations to the City Planning Commission to advance an urban sustainability-focused agenda. The City Planning Commission has tasked you with providing a new vision for a part of NYC, using principles of urban ecology and sustainability. For this

assignment, you will use Manahatta 2409 Vision Maker to help create and present your vision to the class as if your classmates were members of the City Planning Commission.

How will you restore, redesign, or otherwise improve the existing urban habitat for ecosystem services and biodiversity? What will this new vision look like? What are your ecological goals and targets? Might you manage for carbon sequestration, natural flood control, corridors for wildlife, climate regulation, habitat for plants or birds or pollinators, or other ecosystem services?

Remember, you will need to convince your audience that your recommendations are worth implementing. WHY are you making these recommendations? What impacts do you expect? What are the trade-offs? What are the costs, and what are the benefits?

You will be given an area of NYC to work with in Vision Maker. Each member of your project team can focus on one particular aspect of this "green makeover" – i.e., biodiversity, ecosystem services, stormwater management, carbon sequestration, access to green space, energy efficiency, etc. There is a fair amount of flexibility here; your group may choose to focus on the entire project area and propose large-scale changes (i.e., a wildlife corridor), or focus on a smaller area within the larger project area and propose small-scale changes (i.e. a restored forest patch on a few city blocks). Alternatively, each team member may choose to focus on different smaller areas within the larger project area. Vision Maker will be especially useful in providing a graphic depiction of your recommendations as well as an estimate of cost/benefits.

Think about citing what's been done in another city as an example of what you'd want to do. It would also help others understand your plan if you show photos/depictions of the current state and your proposed improved state. Be creative!

- Each team and their specific project area will be established by Week 6.
- The group presentation should give a brief overview of the current ecological state of your assigned neighborhood (in other words, why do you think it needs improvement?).
- Each member of the team will focus on a specific subtopic related to the project. For example, you might consider a subset of the following topics: water, climate, green space, ecosystem services, wildlife, biodiversity, habitat, and cultural attitudes towards the city's natural environment. Each member will prepare a brief of that topic, and summarize that work in a segment of the final presentation (approx. 5-8 slides and 7-10 minutes per person).
- Additionally, each member of the team will independently write and submit a 3-6 page brief on their own subtopic related to the project.
- Your final course project will be graded on a numeric scale from 0 to 100. The in-class (or online) presentation and the individual paper will each account for 50 points. The in-class presentation will be graded as follows: 10 points for design and quality of the presentation visuals; 10 points for the clarity and pace of the oral presentation; 30 points for substantive discussion of the topic. The individual paper will be graded as follows: 10 points for clarity of writing and quality of research; 10 points for ecological background of your study area; 30 points for your ecological initiatives and how they will improve the sustainability of your study area. Full details on these Final Project options and specific grading rubrics can be found on Canvas.

## Grading

The final grade will be calculated as described below:

**FINAL GRADING SCALE**

| Grade | Percentage |
|---|---|
| **A+** | 98–100 % |
| **A** | 93–97.9 % |
| **A-** | 90–92.9 % |
| **B+** | 87–89.9 % |
| **B** | 83–86.9 % |
| **B-** | 80–82.9 % |
| **C+** | 77–79.9 % |
| **C** | 73–76.9 % |
| **C-** | 70–72.9 % |
| **D** | 60–69.9 % |
| **F** | 59.9% and below |

| Assignment/Assessment | % Weight | Individual or Group/Team Grade |
|---|---|---|
| Class Participation / Discussion | 15% | Individual |
| Introduction Video and Biodiversity Response | 5% | Individual |
| Weekly Discussion Board Posts | 30% | Individual |
| Midterm Assignment | 20% | Individual |
| Final Project | 30% | Individual / Team |

## Course Schedule/Course Calendar

| Date | Topic | Readings (due on this date) | Assignments (due on this date) |
|---|---|---|---|
| 1/22 | Introduction Urban Ecology | None | None |
| 1/29 | Ecology Crash Course I | **Required:**<br><br>LaNier, R. (1975). Developing an ecological framework for the planning of human settlements. *Urban Ecology 1,* 1-4.<br><br>Spirn, A.W. (1984). The Granite Garden. Basic Books, New York, NY, USA. **Prologue**<br><br>Wu, J. (2014). Urban ecology and sustainability: The state-of-the-science and future directions. *Landscape and Urban Planning, 125,* 209-221. | Online Introduction Video and Urban Ecology Concept Map |

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| | | **Recommended:**<br><br>Tanner, C.J., *et al.* (2014). Urban ecology: Advancing science and society. *Frontiers in Ecology and the Environment, 12,* 574-581. | |
| 2/5 | Ecology Crash Course II | **Required:**<br><br>Marris, E. (2011). Rambunctious Garden: Saving Nature in a Post-Wild World. Bloomsbury USA, New York, NY. **Chapters 1-3.**<br><br>Steffen, W., *et al.* (2015). Planetary boundaries: Guiding human development on a changing planet. *Science, 347,* 1259855. | Response to Classmates' Online Introduction Videos |
| 2/12 | Urban Ecosystems I: Climate and Biogeochemistry | **Required:**<br><br>Marris, E. (2011). Rambunctious Garden: Saving Nature in a Post-Wild World. Bloomsbury USA, New York, NY. **Chapters 4-6.**<br><br>Churkina, G. (2008). Modeling the carbon cycle of urban systems. *Ecological Modelling, 216,* 107-113.<br><br>**Recommended:**<br><br>Kaye, J.P., Groffman, P.M., Grimm, N.B., Baker, L.A., & Pouyat, R.V. (2006). A distinct urban biogeochemistry? *TRENDS in Ecology and Evolution, 21,* 192-199. | Week 4 Discussion Board Post |
| 2/19 | Urban Ecosystems II: Soils and Hydrology | **Required:**<br><br>Marris, E. (2011). Rambunctious Garden: Saving Nature in a Post-Wild World. Bloomsbury USA, New York, NY. **Chapters 7-8.**<br><br>Bowen, J.L. & I. Valiela, I. (2001). The ecological effects of urbanization on coastal watersheds: historical increases in nitrogen and eutrophication of Waquoit Bay estuaries. *Canadian Journal of Fisheries and Aquatic Sciences, 58,* 1489-1500.<br><br>Paul, M.T., & Meyer, J.L. (2001). Streams in the urban landscape. *Annual Review of Ecology and Systematics, 32,* 333-365.<br><br>**Recommended:** | Week 5 Discussion Board Post |

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| | | Bray, N. & Wickings, K. (2019).The roles of invertebrates in the urban soil microbiome. *Frontiers in Ecology and Evolution, 7,* 00359. | |
| 2/26 | Urban Ecosystems III: Biodiversity | **Required:**<br><br>Aronson, M.F.J., *et al.* (2014). A global analysis of the impacts of urbanization on bird and plant diversity reveals key anthropogenic drivers. *Proceedings of the Royal Society B, 281*, 20133330.<br><br>Cardinale, B.J., *et al*. (2012). Biodiversity loss and its impact on humanity. *Nature*, *486,* 59-67.<br><br>Del Tredici, P. (2010). Wild Urban Plants of the Northeast: A Field Guide. Cornell University Press, Ithaca, NY.<br><br>Hooper, D.U., *et al.* (2012). A global synthesis reveals biodiversity loss as a major driver of ecosystem change. *Nature*, *486*(7401), 105–108.<br><br>Luniak, M. (2004). Synurbanization – adaptation of animal wildlife to urban development. Pgs 50-55 in Shaw, W.W., L.K. Harris, and L. Vandruff, Eds. Proceedings of the 4th International Urban Wildlife Symposium. School of Natural Resources, College of Agriculture and Life Science, University of Arizona, Tucson, AZ.<br><br>**Recommended:**<br><br>Bee, M.A., & Swanson, E.M. (2007). Auditory masking of anuran advertisement calls by road traffic noise. *Animal Behaviour, 74,* 1765-1776.<br><br>Chapin III, F.S., *et al.* (2000). Consequences of changing biodiversity. *Nature, 405,* 234-242.<br><br>Ellis, E.C., Antill, E.C., & Kreft, H. (2012). All is not loss: Plant biodiversity in the Anthropocene. *PLoS ONE, 7,* e30535.<br><br>Ives, C.D., *et al.* (2015). Cities are hotspots for threatened species. *Global Ecology and Biogeography*, *25*(1), 117–126.<br><br>McKinney, M.L. (2006). Urbanization as a major cause of biotic homogenization. *Biological Conservation, 127,* 247-260.<br><br>Matteson, K.C., Ascher, J.S., & Langellott, G.A. (2008). Bee richness and abundance in New York City urban gardens. *Annals of the Entomological Society of America, 101,* 140-150. | Week 6 Discussion Board Post |

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| | | Neil, K., & Wu, J. (2006). Effects of urbanization on plant flowering phenology: A review. *Urban Ecosystems, 9,* 243-257.<br><br>Pimm, S.L., & Raven, P. (2000). Biodiversity: Extinction by numbers. *Nature, 403*, 843-845.<br><br>Staudinger, M.D. et al. (2013). Biodiversity in a changing climate: A synthesis of current and projected trends in the US. *Frontiers in Ecology and the Environment, 11*(9), 465-473.<br><br>Schilthuizen, M. (2016). Evolution is happening faster than we thought. The New York Times. https://www.nytimes.com/2016/07/24/opinion/sunday/evolution-is-happening-faster-than-we-thought.html<br><br>Suárez-Rodríguez, M., Montero-Montoya, R.D., & Garcia, C.M. (2017). Anthropogenic nest materials may increase breeding costs for urban birds. *Frontiers in Ecology and Evolution, 5,* 00004.<br><br>Taft, D. (2015, July 3). Wild in the streets: A 24-hour field guide to New York City. *The New York Times*. http://www.nytimes.com/interactive/2015/07/03/nyregion/A-24-Hour-Field-Guide-to-New-York-City.html | |
| 3/4 | Urban Ecosystems IV: Disturbance Regimes and Landscape Ecology | **Required:**<br><br>Ellis, E.C., & Ramankutty, N. (2008). Putting people in the map: anthropogenic biomes of the world. *Frontiers in Ecology and the Environment, 6,* 439-447.<br><br>[Additional readings TBD]<br><br>**Recommended:**<br>TBD | Week 7 Discussion Board Post |
| 3/11 | Academic Holiday – No Class | None | None |
| 3/18 | Human Behavior and Equity in the Urban Environment | **Required:**<br><br>Miller, J.R. (2005). Biodiversity conservation and the extinction of experience. *TRENDS in Ecology and Evolution, 20*, 430-434.<br><br>Rowland-Shea, J., Doshi, S., Edberg, S., & Fanger, R. (2020). The Nature Gap: Confronting racial and economic disparities in the destruction and protection of Nature in America. Center for American Progress. Washington, DC. | Week 8 Discussion Board Post |

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| | | Schell, C.J., *et al.* (2020). The ecological and evolutionary consequences of systemic racism in urban environments. *Science, 369,* 6510.<br><br>**Recommended:**<br><br>Axon, S. (2017). "Keeping the ball rolling": Addressing the enablers of, and barriers to, sustainable lifestyles. *Journal of Environmental Psychology, 52*, 11-25.<br><br>Martin, C., & Czellar, S. (2017). Where do biospheric values come from? A connectedness to nature perspective. *Journal of Environmental Psychology, 52,* 56-68.<br><br>McEwan, K., Ferguson, F.J., Richardson, M., & Cameron, R. (2020). The good things in urban nature: A thematic framework for optimizing urban planning for nature connectedness. *Landscape and Urban Planning, 194,* 103687.<br><br>Milbrath, L.W. (1995). Psychological, Cultural, and Informational Barriers to Sustainability. *Journal of Social Issues, 51,* 101-120. | |
| 3/25 | Urban Ecology Solutions I: The 3 R's | **Required:**<br><br>Marris, E. (2011). Rambunctious Garden: Saving Nature in a Post-Wild World. Bloomsbury USA, New York, NY. **Chapters 9-10.**<br><br>Aronson, M.F.J., *et al*. (2017). Biodiversity in the city: key challenges for urban green space management. *Frontiers in Ecology and the Environment, 15*, 189-196.<br><br>Hobbs, R.J., Higgs, E., & Harris, J.A. (2009). Novel ecosystems: implications for conservation and restoration. *Trends in Ecology & Evolution, 24,* 599-605.<br><br>Kueffer, C., & Kaiser-Bunbury, C.N. (2014). Reconciling conflicting perspectives for biodiversity conservation in the Anthropocene. *Frontiers in Ecology and the Environment, 12,* 131-137.<br><br>Nilon, C.H., *et al.* (2017). Planning for the future of urban biodiversity: A global review of city-scale initiatives. *BioScience, 67,* 332-342.<br><br>**Recommended:** | Midterm Podcast/Vodcast |

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| | | Lepczyk, C.A., *et al.* (2017). Biodiversity in the city: Fundamental questions for understanding the ecology of urban green spaces for biodiversity conservation. *BioScience*, *67*(9), 799–807.<br><br>Li, E., Parker, S.S., Pauly, G.B., Randall, J.M., Brown, B.V., & Cohen, B.S. (2019). An urban biodiversity assessment framework that combines an urban habitat classification scheme and citizen science data. *Frontiers in Ecology and Evolution, 7,* 00277.<br><br>Lundholm, J.T., & Richardson, P.J. (2010). Habitat analogues for reconciliation ecology in urban and industrial environments. *Journal of Applied Ecology, 47,* 966-975.<br><br>McDonnell, M.J., & Hahs, A.K. (2013). The future of urban biodiversity research: Moving beyond the 'low-hanging fruit.' *Urban Ecosystems, 16,* 397-409.<br><br>Miller, J.R., & Hobbs, R.J. (2002). Conservation where people live and work. *Conservation Biology, 16,* 330-337.<br><br>Threlfall, C.G., & Kendal, D. (2018). The distinct ecological and social roles that wild spaces play in urban ecosystems. *Urban Forestry & Urban Greening, 29,* 348-356. | |
| 4/1 | Urban Ecology Solutions II: Ecological Urban Design and Nature-Based Solutions | **Required:**<br><br>Francis, R.A., & J. Lorimer, J. (2011). Urban reconciliation ecology: The potential of living roofs and walls. *Journal of Environmental Management, 92,*1429-1437.<br><br>Lovell, S.T., & Taylor, J.R. (2013). Supplying urban ecosystem services through multifunctional green infrastructure in the United States. *Landscape Ecology, 28,* 1447-1463.<br><br>Hobbs, R.J., *et al.* (2014). Managing the whole landscape: historical, hybrid, and novel ecosystems. *Frontiers in Ecology and the Environment, 12,* 557-564.<br><br>Ozer, E. (2014). Mutualistic relationships versus hyper-efficiencies in the sustainable building and city. *Urban Ecosystems, 17,* 195-204.<br><br>**Recommended:**<br><br>Clevenot, L., Carré, C., & Pech, P. (2018). A review of the factors that determine whether stormwater ponds are ecological traps and/or high-quality breeding sites for amphibians. *Frontiers in Ecology and Evolution, 6,* 00040. | Week 11 Discussion Board Post |

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| | | Francis, R.A. (2010). Wall ecology: A frontier for urban biodiversity and ecological engineering. *Progress in Physical Geography, 35,* 43-63.<br><br>Hamer, A.J., Smith, P.J., & McDonnell, M.J. (2012). The importance of habitat design and aquatic connectivity in amphibian use of urban stormwater retention ponds. *Urban Ecosystems, 15,* 451-471.<br><br>Rudd, H., Vala, J., & Schaefer, V. (2002). Importance of backyard habitat in a comprehensive biodiversity conservation strategy: A connectivity analysis of urban green spaces. *Restoration Ecology, 10,* 368-375. | |
| 4/8 | Economics of Urban Ecology | **Required:**<br><br>Elmqvist, T., *et al.* (2015). Benefits of restoring ecosystem services in urban areas. *Current Opinion in Environmental Sustainability, 14,* 101-108.<br><br>Gómez-Baggethun, E., & Barton, D.N. (2013). Classifying and valuing ecosystem services for urban planning. *Ecological Economics, 86,* 235-245.<br><br>Ring, I., *et al.* (2010). Challenges in framing the economics of ecosystems and biodiversity: the TEEB initiative. *Current Opinion in Environmental Sustainability, 2,* 15-26.<br><br>**Recommended:**<br><br>Botzat, A., Fischer, L.K., & Kowarik, I. (2016). Unexploited opportunities in understanding liveable and biodiverse cities. A review on urban biodiversity perception and valuation. *Global Environmental Change, 39,* 220-233.<br><br>Department for Environment, Food and Rural Affairs. (2007). An introductory guide to valuing ecosystem services. Defra Publications, London, UK.<br><br>TEEB – The Economics of Ecosystems and Biodiversity. (2011). TEEB Manual for Cities: Ecosystem Services in Urban Management. | Week 12 Discussion Board Post |
| 4/15 | Case Studies and Conclusions | **Required:**<br><br>Jansson, A. (2013). Reaching for a sustainable, resilient urban future using the lens of ecosystem services. *Ecological Economics, 86,* 285-291.<br><br>Rees, W., & Wackernagel, M. (1996). Urban Ecological Footprints: Why cities cannot be sustainable – and why they | None – Work on presentations! |

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| | | are a key to sustainability. *Environmental Impact Assessment Review, 16,* 223-248.<br><br>**Recommended:**<br><br>Aloisio, J.M., Palmer, M.I., Tuininga A.R., & Lewis, J.D. (2019). Plant colonization of green roofs is affected by composition of established native plant communities. *Frontiers in Ecology and the Environment, 6,* 00238.<br><br>Beier, et al. (2007). Conceptual steps for designing wildlife corridors. CorridorDesign. http://corridordesign.org/dl/docs/ConceptualStepsForDesigningCorridors.pdf<br><br>Borysiak, J., Mizgajski, A., & Speak, A. (2017). Floral biodiversity of allotment gardens and its contribution to urban green infrastructure. *Urban Ecosystems, 20,* 323-335.<br><br>Colla, S.R., Willis, E., & Packer, I. (2009). Can green roofs provide habitat for urban bees (Hymenoptera: Apidae)? *Cities and the Environment, 2,* 1-12.<br><br>Klem Jr., D. (2009). Avian mortality at windows: the second largest human source of bird mortality on Earth. Proceedings of the 4th International Partners in Flight Conference , 13-16 February 2008. Ed. T. D. Rich, C. Arizmendi, D. Demarest, and C. Thompson McAllen, Texas, USA. Partners in Flight, USDA, Forest Service Technical Report, 2009.<br><br>Ksiazek-Mikenas, K., Fant, J.B., & Skogen, K.A. (2019). Pollinator-mediated gene flow connects green roof populations across the urban matrix: A paternity analysis of the self-compatible forb *Penstemon hirsutus*. *Frontiers in Ecology and Evolution, 7,* 00299.<br><br>McGregor, M., Matthews, K., & Jones, D. (2017). Vegetated fauna overpass disguises road presence and facilitates permeability for forest microbats in Brisbane, Australia. *Frontiers in Ecology and Evolution, 5,* 00153.<br><br>NATURA Environmental Consultants, & O'Connor, D. (2008). Green City Guidelines. UCD Urban Institute Ireland, Dublin, Ireland.<br><br>Odell, E.A., Theobald, D.M., & Knight, R.L. (2003). Incorporating ecology into land use planning: the songbirds' case for clustered development. *Journal of the American Planning Association, 69,* 72-82. | |

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| | | Rosenzweig, M.L. (2003). Win-Win Ecology: How the Earth's Species Can Survive in the Midst of Human Enterprise. Oxford University Press, Inc., New York, NY, USA.<br><br>Walsh, C.J., Fletcher, T.D., & Ladson, A.R.. (2005). Stream restoration in urban catchments through redesigning stormwater systems: looking to the catchment to save the stream. *Journal of the North American Benthological Society, 24*, 690-705. | |
| 4/22 | Final Project Presentations I | None | Final Project Presentations |
| 4/29 | Final Project Presentations II | None | Final Project Presentations and Written Briefs<br><br>Final Urban Ecology Concept Map |

## Course Policies

Our classroom is a shared learning community and one where diverse experiences and opinions are highly valued. Please remember to be respectful at all times and to share ideas and thoughts in a non-judgmental, respectful, and empathetic manner. I cannot stress enough that we are all life-long learners, and we should take every opportunity to learn from each other in this course, which could mean considering new perspectives, challenging prevailing assumptions, working through difficult conversations, and embracing the discomfort and mis-steps that can accompany the process of personal and professional growth.

*Participation and Attendance*
You are expected to complete all assigned readings, attend all class sessions, and engage with others in discussions. I expect you to come to class on time and thoroughly prepared. I will keep track of attendance and look forward to an interesting, lively and confidential discussion. If you miss an experience in class, you miss an important learning moment and the class misses your contribution. Please make every effort to communicate planned absences ahead of time.

*Late work*
Assignments are due at the start of the class session on the dates/times identified. Points will be deducted from any assignment submitted after the due date/time, as specific in the grading rubrics on Canvas. Assignments not received by the time final grades must be submitted will receive zero points for the assignment. Extensions may be granted in especially warranted situations as per the instructor's discretion.

*Citation & Submission*
All written assignments must use standard citation format (e.g., MLA, APA, Chicago), cite sources, and be submitted to the course website (not via email).

## School and University Policies and Resources

*Copyright Policy*

Please note—Due to copyright restrictions, online access to this material is limited to instructors and students currently registered for this course. Please be advised that by clicking the link to the electronic materials in this course, you have read and accept the following:

> The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," that user may be liable for copyright infringement.

*Academic Integrity*

Columbia University expects its students to act with honesty and propriety at all times and to respect the rights of others. It is fundamental University policy that academic dishonesty in any guise or personal conduct of any sort that disrupts the life of the University or denigrates or endangers members of the University community is unacceptable and will be dealt with severely. It is essential to the academic integrity and vitality of this community that individuals do their own work and properly acknowledge the circumstances, ideas, sources, and assistance upon which that work is based. Academic honesty in class assignments and exams is expected of all students at all times. SPS holds each member of its community responsible for understanding and abiding by the SPS Academic Integrity and Community Standards posted at https://sps.columbia.edu/students/student-support/academic-integrity-community-standards. You are required to read these standards within the first few days of class. Ignorance of the School's policy concerning academic dishonesty shall not be a defense in any disciplinary proceedings.

*Diversity Statement*

It is our intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength and benefit. It is our intent to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture.

*Accessibility*

Columbia is committed to providing equal access to qualified students with documented disabilities. A student's disability status and reasonable accommodations are individually determined based upon disability documentation and related information gathered through the intake process. For more information regarding this service, please visit the University's Health Services website: https://health.columbia.edu/content/disability-services.

*Class Recordings*

All or portions of the class may be recorded at the discretion of the instructor to support your learning. At any point, the instructor has the right to discontinue the recording if it is deemed to be obstructive to the learning process.
If the recording is posted, it is confidential and it is prohibited to share the recording outside of the class.

*Use of Artificial Intelligence (AI)*

AI generative or machine learning tools can be used to assist with course deliverables, provided that all utilized information is cited in accordance with program guidelines. In addition, note that information produced by AI generative tools may be inaccurate or outdated. Please speak with your instructor if you have questions about course specific policies relating to usage of AI generative tools.

*SPS Academic Resources*

The Division of Student Affairs provides students with academic counseling and support services such as online tutoring and career coaching: https://sps.columbia.edu/students/student-support/student-support-resources.



Adapted from: **The Course Syllabus: A Learning-Centered Approach, 2nd Edition,** Judith Grunert O'Brien, Barbara J. Millis, Margaret W. Cohen. ISBN: 978-0-470-60549-3. Available as an E-Book from Wiley at:
https://www.wiley.com/en-us/The+Course+Syllabus%3A+A+Learning+Centered+Approach%2C+2nd+Edition-p-9780470605493

*Columbia University Information Technology*
Columbia University Information Technology (CUIT) provides Columbia University students, faculty and staff with central computing and communications services. Students, faculty and staff may access University-provided and discounted software downloads.

*Columbia University Library*
Columbia's extensive library system ranks in the top five academic libraries in the nation, with many of its services and resources available online.

*The Writing Center*
The Writing Center provides writing support to undergraduate and graduate students through one-on-one consultations and workshops. They provide support at every stage of your writing, from brainstorming to final drafts. If you would like writing support, please visit the following site to learn about services offered and steps for scheduling an appointment. This resource is open to Columbia graduate students at no additional charge. Visit http://www.college.columbia.edu/core/uwp/writing-center.

*Career Design Lab*
The Career Design Lab supports current students and alumni with individualized career coaching including career assessment, resume & cover letter writing, agile internship job search strategy, personal branding, interview skills, career transitions, salary negotiations, and much more. Wherever you are in your career journey, the Career Design Lab team is here to support you. Link to https://careerdesignlab.sps.columbia.edu/


Adapted from: **The Course Syllabus: A Learning-Centered Approach, 2nd Edition,** Judith Grunert O'Brien, Barbara J. Millis, Margaret W. Cohen. ISBN: 978-0-470-60549-3. Available as an E-Book from Wiley at:
https://www.wiley.com/en-us/The+Course+Syllabus%3A+A+Learning+Centered+Approach%2C+2nd+Edition-p-9780470605493