BIO 377 Environmental Management & Health (3 credits)

Prerequisite: BIO 104 Time: Mondays & Thursdays 2:00-3:20 Location: MNS 213

Instructor: Dr. Loren B. Byrne Phone: X 3890 Email: lbyrne@rwu.edu
Office: 227 MNS Office Hours: Mon & Wed 11-12; Mon & Thurs 1-2; or by appt.

Quotes that summarize Dr. Byrne's teaching and learning philosophy

"The mind is not a vessel to be filled but a fire to be kindled." ~ Plutarch
"Teachers open the door. You must enter by yourself." ~ Chinese proverb
"(Intelligence) is 1% inspiration and 99% perspiration." ~ Thomas Alva Edison
"Today a reader, tomorrow a leader." ~ W. Fusselman
"When we try to pick out anything by itself, we find it is tied to everything else in the universe." ~ John Muir
"High-quality learning is absolutely essential for high-quality living." ~ L. Dee Fink

Course description

This course examines issues at the intersection of ecology, public health and sustainability with an emphasis on using biological science to understand how urbanized system can be designed and managed in ways that enhance environmental quality (e.g., reduced pollution, more green space) and, consequently, improve human health and well-being. By necessity, this goal requires the integration of ecological and sociocultural variables to develop a more holistic, systems-level approach to environmental and health issues, as exemplified by the perspectives of community-based adaptive ecosystem management and One Health. On the ecological side, understanding and managing biodiversity and ecosystems are now known to relate to many public health issues; on the sociocultural side, many economic, cultural and psychological variables interact to affect ecological variables that in turn affect human health. The interlinkage of sociocultural and ecological variables is especially pronounced in urbanized environments (inclusive of city centers through suburban and exurban landscapes) where most people around the world now reside. Through the integrated study of ecosystem management and public health, students will gain knowledge and skills that will enable them to collaboratively work toward increasing the health of urban people and sustainability of urban socio-environmental systems.

Be prepared: this course is **reading and discussion** intensive, like a seminar (a good thing for your education—see quotes 3 and 4 above). Thus, you will maximize your learning if you read assigned texts carefully and critically before class and then ***engage with your classmates*** about the material during class.

Course goals for learning outcomes

After this course, students should be able to:

- Describe the perspectives of ecosystem management and One Health and apply them to specific example situations
- Discuss the structure and dynamics of urbanized environments in terms of complex socio-ecological systems and how this view relates to the study of ecosystem management interventions and public health issues
- Synthesize ecological and sociocultural information to describe appropriate management interventions for socio-environmental and public health problems that lead to practical solutions, especially in urbanized environments
- Explain how environmental conditions, biodiversity and ecosystems relate to and affect the health of humans, across individual through community and global scales, by referring to specific research and case studies
- Analyze a wide range of public health issues using an integrated urban socio-ecological systems perspective
- Devise and discuss ecosystem management plans for addressing public environmental health concerns from local through global scales, especially for urbanized environments
- Articulate and defend the value of pursuing transdisciplinary, scientific knowledge and understanding

Required readings

Articles will be selected from the primary scientific literature, news outlets and resources from organizations

Required assignments & grading

Students' grades will be based on the following:	**% Value of final grade**
Home- and in-class work (incl. half-sheets, worksheets, essays)	20
Seminar participation & attendance (article sharing, discussion, writing) (12-14)	20
Small review projects & presentations (4 @ 15 min)	20
Original project & presentation	20
Final exam questions (take-home essays)	15
Final oral exam (discussion about final exam answers during final exam period)	5

Grading scale and the meaning of grades:

A= ≥ 93% Excellent	A- = 90-92.9% Great	B+ = 87-89.9% Very Good	B= 83-86.9% Good	B- = 80-82.9% Good
C+= 77-79.9% Average	C= 73-76.9% Average	C- = 70-72.9% Average	D= 60-69.9% Poor	F= ≤59.9% Failure

BIO 377 Environmental Management and Health: Semester Outline

Week	Topic	Readings *(complete before class)*
1	1/23: Introductions	
2	**Part I: The Urban Forest as an Intro Case Study** 1/27: What are current tree planting programs? 1/30: What are health impacts of urban trees?	 1/27: City tree program websites 1/30: Peer-reviewed article
3	2/3: How should trees be chosen & managed? **Part II: Landscape Mgmt as an Intro Case Study** 2/6: Systems Thinking & Ecological Landscaping	2/3: Peer-reviewed article 2/6: Odum 1982; Byrne & Grewal 2008
4	2/10: Problems with pesticides 1 2:13: Problems with pesticides 2	 2/13: Peer-reviewed & news articles
5	2/19: Integrated & organic pest management 2/20: Developing & managing Sustainable Sites	2/19: Peer-reviewed article (assigned) 2/20: SITES Rating System document
6	**Part III: Integrating Ecology, Mgmt & Health** 2/24: Community (food) gardens & community health; Horticulture therapy & mental health 2/27: Plants & allergies	 2/24: Peer-reviewed article (chosen) 2/27: Peer-reviewed article (chosen)
7	3/2: Urban mammal ecology & management 3/5: Outdoor fire management	3/2: Peer-reviewed & news articles (chosen) 3/5: Peer-reviewed & news articles (chosen)
8	3/16: One Health 1: Ticks & Lyme disease 3/19: One Health 2: Mosquitoes	*Classes from 3/16 through 4/16 are 15-min student presentations, each student has three*
9	3/23: Water pollution & management 3/26: Litter & solid waste effects & management	
10	3/30: Soil pollution & management 4/2: Air pollution & management (incl. asthma)	
11	4/6: Thermal pollution & management (UHIE) 4/9: Indoor ecosystems: Sick & green buildings	
12	4/13: Indoor ecosystems: "We are not alone" 4/16: Urban restoration ecology	
13	**Part IV: Synthesis, Reflection & Conclusions** 4/20: Outreach & Nudges: Can behavior be shifted? Adaptive Ecosystem Co-Management 4/23: Urban Environmental Justice & Ethics: Health for All	 4/20: Assigned readings TBD 4/23: Peer-reviewed articles (found)
14	4/27: Urban Planning & Climate change 4/30: Project presentations	4/27: TBD
15	5/4: Presentations continued; Summary: What have we learned? What else do we need to know?	5/4: TBD

FINAL EXAM PERIOD: Friday May 8, 12:30-2:30pm, Required discussion; ***final essays due***

****The professor reserves the right to modify this schedule at any time if necessary****