Course Syllabus

IB 453 Community Ecology
Cross-listed as NRES 452
Credit Hours: 3
Pre-requisite: IB203 Ecology or equivalent, or consent of instructor

Instructor: Prof. James Dalling, 149 Morrill Hall, Department of Plant Biology
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Course description

Community Ecology explores the direct and indirect interactions among species and the environment that determine the structure and composition of plant, animal, and microbial communities. The course begins with discussion of classical theory developed around pairwise species interactions of competition, predation and mutualism, before scaling up to consider community structure at meso- and macro-scales, the importance of stochastic events and dispersal limitation, latitudinal diversity gradients and diversity-productivity relationships. Weekly discussions are held to critique classic and recent papers in community ecology. In the last two weeks of the semester students develop a proposal to explore in detail a species interaction of their choice, and develop a short presentation to the class.

Recommended course texts:

Highly recommended:

Mittelbach Community Ecology. Sinauer Publisher 2012 or

Mittelbach and McGill Community Ecology Second Edition

https://www.amazon.com/gp/product/0198835868?pf_rd_r=XT745EYAHASP5RX3GGM0&pf_rd_p=5ae2c7f8-e0c6-4f35-9071-dc3240e894a8&pd_rd_r=2628e2d2-d2b2-4191-8a5f-395b27355102&pd_rd_w=bOTek&pd_rd_wg=rBBkA&ref_=pd_gw_unk

Also useful:

Gotelli Primer in Ecology. Sinauer Publisher (multiple editions are available)

https://www.amazon.com/Primer-Ecology-Nicholas-J-Gotelli/dp/0878933182/ref=sr_1_6?dchild=1&keywords=primer+in+ecology&qid=1610035301&s=books&sr=1-6

Learning Outcomes:

(1) Describe the historical roots of community ecology that led to core concepts of how communities are structured.

(2) Explain how the equations of simple species interaction models are derived, and how they can be used to predict the outcome of multiple species interactions: predation and competition.

(3) Identify, and evaluate the importance of processes that operate at scales larger than pairwise species interactions that contribute to community organization.

(3) Critique evidence for three current hypotheses for how species diversity is maintained in communities.

(4) Obtain familiarity and understanding of how scientific papers are organized, hypotheses are tested, and how data are presented effectively.

(5) Use experience of critiquing published literature, together with understanding of course content, to develop a novel hypothesis (or test of a hypothesis), and to present it in the context of previous work in the form of a written proposal and a short presentation.

## Course calendar

Detailed information on weekly class topics, reading assignments, assignment due dates, lecture notes, a specimen mid-term exam and a specimen term paper are available on the course Moodle page

## Course grading (see syllabus page on moodle)

## Course attendance policy

I know this semester will be challenging – I'm here to help and make accommodations where possible. Let me know by email if you want to discuss anything that is causing anxiety and I will see what I can do to help. With that in mind, be aware that you are expected to attend all synchronous classes including all discussions. Failure to attend discussions may result in the loss of the discussion participation grade and extra credit (potentially 15% of the grade). Attendance is recorded during the discussion section. Anticipated absences from class (e.g., graduate students doing fieldwork or attending meetings) must be discussed with me ahead of time for discussion work to be counted toward the final grade.

An absence letter or a request for accommodation is required under the following circumstances:
(i) Prolonged illness or injury
(ii) Illness, injury or death of a family member
(iii) Observance of religious beliefs
(iv) Volunteer emergency work
(v) Compelling circumstances beyond your control
If you have questions call or send me an email.

Further information on student accommodations is available on the student code:
http://studentcode.illinois.edu/article1_part5_1-501.html

## Academic Integrity

According to the Student Code, `It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions.' Please know that it is my responsibility as an instructor to uphold the academic integrity policy of the University, which can be found here: http://studentcode.illinois.edu/article1_part4_1-401.html

## Disability accommodations

To ensure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class are asked to see me as soon as possible.

Weekly topics covered in Community Ecology

Week 1
Introduction to Community Ecology
Introduction to Competition models

Week 2
Competition models
Niche concepts, character displacement

Week 3
Mutualism

Week 4
Predation

Week 5
Predation and Mid-term

Week 6
Trophic cascades

Week 7
Diversity metrics and food webs

Week 8
Island Biogeography

Week 9
Phylogenetic community ecology

Week 10
Maintenance of Diversity and mid-term 2

Week 11
Maintenance of diversity II

Week 12
Invasive species
Diversity gradients

Week 13
Diversity-productivity relationships

Week 14
Class presentations of term projects

Week 15
Class presentations of term projects and final exam