## Syllabus: PCB 6447C (section 23BG) & ZOO4926 (246A) Community Ecology, Spring 2020

Instructors: Robert D. Holt, 111 Bartram Hall, 392-6917, <u>rdholt@ufl.edu</u> Mathew Leibold, 627 Bartram Hall, 512-636-9824, mleibold@ufl.edu Administrative Assistant: Mrs. Vitrell Sherif, vitrell@ufl.edu

Office Hours: By appointment

Class time and place: Tuesdays & Thursdays 12:50-2:45 (periods 6-7), Room 521 Carr Hall Credit hours: 4 credits

There will also be a special-topic undergraduate course for Community Ecology. If anyone is interested, please contact the instructors.

Required Text: Community Ecology, 2<sup>nd</sup> ed. Gary G. Mittelbach and Brian J. McGill, 2019, ISBN: 978-0-19-883586-8 (paperbound).

Highly recommended: A Primer of Ecology, 4th Ed., Nicholas J. Gotelli, 2008, ISBN: 978-0-87893-318-1. The Reitz Union bookstore should have copies of the required text. If they run out, more can be ordered. Also, one can order directly from the publisher, the paperback is \$50, https://global.oup.com/academic/product/community-ecology-9780198835868?lang=en&cc=us There is also an e-version. Please do NOT rely upon used copies of the 1<sup>st</sup> edition of Mittelbach, there are substantial changes in the the text. The book by Gotelli does a fine job walking through some of the basic models of ecology, and if you have not had experience with such models, you should work through this volume. It is important to read through the assigned Mittelbach and McGill text, prior to lecture.

Additional readings from the primary literature will be assigned, as the class proceeds.

Prerequisites: Instructor's permission, intellectual curiosity, and enthusiasm. It is expected that you will have had instruction in ecology and related disciplines, such as evolution, statistics and biomathematics. This is a graduate course, and so we expect a high level of intellectual engagement with the material. But motivated undergraduates should talk to the instructors for permission to take the parallel undergraduate section.

Course objectives: The overall goal is to help students achieve a rigorous understanding of contemporary community ecology, and how current understanding has arisen from key historical precedents. The basic objective of community ecology is to understand patterns in community assemblages, across time and space. These properties might include species diversity and composition, patterns of interspecific abundance, historical patterns of assembly – and disassembly – and the grounding of all these patterns in the dynamics of interactions among species and their evolutionary histories and ecosystem and physical environment contexts.

We will deal both with theoretical and empirical issues. We hope to make graduate students more literate in the basic concepts of theoretical ecology that are important in community ecology. Although this is not specifically a course on the mechanics of modeling, or computer simulation, or dynamical systems, we will necessarily deal with much abstract, mathematical and computational material. The course will comprise: lectures; readings of a synthetic textbook and primary publications in the historical and contemporary literature; discussions; periodic written assignments, including a term paper. There may be homework assignments dealing with models and simulations. Details about these will be provided later.

## Grades: Grades will be assigned per UF policy (see

http:///www.registrar.ufl.edu/catalog/policies/regulationgrades.html for full details). Your final grade will be determined on the basis of the following: a) Participation 20%, b) short written assignments 20%, c) literature presentation and discussion 30%, d) term paper 30%. Class attendance and etiquette policy. You are expected to come to class and participate in each class period, and to have read and digested the assigned reading material. All absences require a valid reason, and without such a reason, points will be deducted from your class grade. You will be responsible for any material missed in class, and to make up for your absence, you will need to write short essays demonstrating that you have covered the reading assignments so missed. Likewise, points will be deducted from your grade for turning in assignments late. Our policy is to deduct 10% from the grade, per late day, for late assignments.

We expect that in class you will be paying close attention and really engage with lectures and discussions. This means that you should not be checking your email, surfing the web, or otherwise electronically (dis)engaged. Keep cellphones turned off. Please.

Disabilities accommodation: Students requesting classroom accommodation need to register first with the Dean of Students Office. The Dean of Students Office will then provide documentation to the student, who must then provide this documentation to the course instructor, when requesting accommodation.

How the course is structured: We aim to foster interaction and engagement by students in the class. The course consists of a combination of traditional lectures, group discussions, and peer review of student writing. On each topic indicated in the schedule below as a "student-led discussion", there will be one to two hours focused on 2 to 4 papers from the primary literature. Pairs of students will present papers on those days, with each student in a pair taking primary responsibility for 1 to 2 of these. The quality of those presentations will be critical to the quality of the class. But each of you have to closely and carefully read, digest and think about the material, in order for a class discussion to work. To facilitate this, each pair will have a designated "Discussion Leader", who will give a 10-15 minute detailed overview of the paper at the start of the discussion, and a written summary of the basic concept and findings of the paper, along with questions to be brought up in the class discussion. This needs to be turned in to our lab manager, Mrs. Vitrell Sherif (vitrell@ufl.edu), to be distributed to the class, by the morning of the day preceding the day of the discussion. In addition each of you will be required to write a one-paragraph summary of the main points of the papers, and 3 (or more) questions based on each week's readings, and bring this to the class discussion. You will be required to turn these summaries and questions in to the instructors prior to the start of discussion, so please keep a second copy for yourself so that you have the opportunity to raise these questions during the class.

Class Schedule: This schedule is tentative and will probably change. *January* 

## 1 7th, T NO CLASS

- 2 9th, Th What is community ecology? (Preface, and Chapters 1,2) Holt and Leibold
- 3 14th, T Grounding community ecology in population dynamics (Chapter 4) Holt
- 4 16th, Th Predator-prey interaction I (Chapter 5) Holt
- 5 21rd, T Predator-prey interactions II (Chapter 6) Holt
- 6 23th, Th Parasites and pathogens (Chapter 5) Holt
- 7 28th, T Positive interactions in communities (Chapter 9) Holt
- 8 30<sub>th</sub>, Th Mutualisms, from simple to complex (student-led discussion) Holt Quantifying biodiversity (part of Chapter 2) –guest lecture, Sam Scheiner

## February

9 4th, T Interspecific competition – theory (Chapters 7, part of 8) – Guest lecture, Nick Kortessis 10 6th, Th Interspecific competition in nature (Chapter 8) – Leibold

- 11 11th, T Interspecific competition in nature (student-led discussion; Chapter 8) Leibold
- 12 13th, Th Patterns of biological diversity (part of Chapter 2) Leibold

13 18th, T Species interactions in ecological networks I (Chapter 10) - Leibold

14 20th, Th Species interactions in ecological networks II (student-led discussion) - Leibold

15 25th, T Biodiversity and ecosystem function I (Chapter 3) – Leibold

16 27th, Th Biodiversity and ecosystem function II (student-led discussion) - Leibold

\*\*Prospectus for Term Paper Due\*\*

March

3rd, T Spring break

- 5th, Th Spring break
- 17 10th, T Niche construction and ecological engineering Holt; guest lecture, Amanda Subalusky
- 18 12th, Th Niche construction and ecological engineering II (student-led discussion) Holt
- 19 17th, T Food chains, food webs, and natural-enemy impacts on coexistence I (Chapter 11, part of 8) Holt
- 20 19th, Th Food chains and food webs II (student-led discussion) Holt
- 21 24th, T Spatial community ecology I (Chapter 13) Holt
- 22 26th, Th Spatial community ecology Ii (student-led discussion) Holt
- 23 31st, T Metacommunities and Neutral theory (Chapter 14) Leibold

April

24 2nd, Th Evolutionary community ecology (Chapter 16) – Holt

25 7th, T Species coexistence in variable environments (Chapter 15) - Leibold

26 9th, Th Species coexistence (student-led discussion) - Leibold

27 14th, T Community assembly and species traits (Chapter 12) - Leibold

\*\*Term Paper Due\*\*

28 16th, Th Community assembly and species traits (student-led discussion) - Leibold

29 21st, T Concluding Thoughts (Chapter 17) – Holt, Leibold