Introduction to Wildlife Population Ecology (WIS 4501)

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Class Hours: MWF, period 6 (12:50 - 13:40)
Class Room: AND0101

Figure 1: This course is part of the Affordable UF Initiative!

This syllabus is a broad description of course objectives and plan of work; it is subject to change.

1. **Codification**: WIS 4501
2. **Credits**: 3 crds
3. **Pre-requirements**: PCB 3063 OR WIS 3553C OR ARGR 3303, & FOR 3153C OR PCB 3601C OR PCB 4043C OR WIS 3404, & WIS 4601 suggested
4. **Course Description**: How does the human population size changes over time? What are the temporal patterns of influenza in the USA? What are the drivers of boom and bust pest cycles? What will be the predicted outcome of various management strategies? How much can we fish without compromising future fish stocks? The answers to these questions belong to the field of *population ecology* – the study of how population size varies in space and time. Once we understand the patterns and mechanisms behind this temporal variation in abundance we can ultimately explain and predict species distributions. In this course, you will get introduced to the fundamental concepts of population ecology. Because populations are complex and difficult to quantify, we will use an array of models to fulfill our goal.

5. **Course Objectives**: At the completion of this course, students will be able to:

   (a) Recognize concepts and vocabulary related to population ecology applied to wildlife ecology and conservation.

   (b) Describe the key definitions in population ecology.

   (c) Interpret models that describe population size change through time.

   (d) Apply population ecology models to answer questions in wildlife ecology, conservation and management.

6. **Tentative Course Outline**:

   The weekly coverage might change as it depends on the progress of the class. The class is divided into nine sections. I: Introduction, II: Unstructured population growth models, III: Structured population growth models, IV: Metapopulation dynamics, V: Population viability analysis, VI: Species interactions, VII: Wildlife harvest, VIII: Population cycles and regulation, and IX: Life history. Readings are optional but highly recommended. There is a quiz (due Friday), a prep to complete before the lab (due Thursday), and a Group Lab exercise (due Monday after the lab) for almost each week.

Week	Content
Section I	
Week 1 (Aug 21 – 22)	• **Lab F**: Class introduction/Why study population ecology?
Section II	
Week 2 (Aug 25 – 29)	• **Lecture M**: Density independent models (exponential growth) I • **Lecture W**: Density independent models (exponential growth) II • **Lab F**: Density independent models • **Assignment 1**-*Monday*, Prep: Remembering `R` and loops • **Assignment 2**-*Thursday*, Prep: Density independent models • Read: Gotelli (Ch 1), Rockwood (Ch 1)
Week 3 (Sep 1 – 5)	• **Lecture W**: Density dependent models • **Lab F**: Density dependent models • **Assignment 1**-*Tuesday*, Lab: Density independent models • **Assignment 2**-*Thursday*, Prep: Density dependent models • Read: Gotelli (Ch 2), Rockwood (Ch 2)
Section III	
Week 4 (Sep 8 – 12)	• **Lecture M**: Life table analysis • **Lecture W**: Life table analysis II • **Lab F**: Life table analysis (R-lab 3) • **Assignment 1**-*Monday*, Lab: Density dependent models • **Assignment 2**-*Thursday*, Prep: Life table analysis. • Read: Gotelli (Ch 3), Rockwood (Ch 4)

Week	Content
Week 5 (Sep 15 – 19)	• **Lecture M**: Matrix algebra • **Lecture W**: Structured population models I • **Lab F**: Structured population models I • **Assignment 1**-*Monday*, Lab: Life table analysis • **Assignment 2**-*Thursday*, Prep: Structured population models I • Read: Gotelli (Ch 3), Rockwood (Ch 4)
Week 6 (Sep 22 – 26)	• **Lecture M**: Structured population models II • **Lecture W**: Structured population models III • **Lab F**: Structure Population models II • **Assignment 1**-*Monday*, Lab: Structured population models I • **Assignment 2**-*Thursday*, Prep: Structured population models II • Read: Gotelli (Ch3), Rockwood (Ch4)
Section IV Week 7 (Sep 29 – Oct 3)	• **Lecture M**: Exam review • **Lecture W**: Work on exam • **Lecture F**: Metapopulation models I • **Assignment 1**-*Monday*, Lab: Structured population models II • Read: Gotelli (Ch4), Rockwood (Ch5)
Week 8 (Oct 6 – 10)	• **Lecture M**: Metapopulation models II • **Lecture W**: Metapopulation models III • **Lab F**: Metapopulation models • **Assignment 1**-*Thursday*, Prep: Metapopulations • Read: Hanski 1999 (Ch 4, 5)
Section V Week 9 (Oct 13 – 17)	• **Lecture M**: Population viability analysis I • **Lecture W**: Population viability analysis II - Viable Population Monitoring • **Lab F**: Homecoming (no lab) • **Assignment 1**-*Monday*, Lab: Metapopulations • **Assignment 2**-*Thursday*, Prep: Population viability analysis • Read: Rockwood (Ch1)
Section VI Week 10 (Oct 20 – 24)	• **Lecture M**: Competition • **Lecture W**: Predator-prey • **Lab F**: Lotka-Volterra • **Assignment 1**-*Thursday*, Prep: Lotka-Volterra • Read: Gotelli (Ch 5,6), Rockwood (Ch 7, 10)

Week	Content
Week 11 (Oct 27 – 31)	• **Lecture M**: Disease models I • **Lecture W**: Disease models II • **Lab F**: Disease models • **Assignment 1**-*Monday*, Lab: Lotka-Volterra • **Assignment 2**-*Thursday*, Prep: Disease models • Read: Keeling and Rohani 2011 (Ch 2)
Section VII Week 12 (Nov 3 – 7)	• **Lecture M**: Exam review • **Lecture W**: Work on exam 2 • **Lab F**: Population harvest • **Assignment 1**-*Monday*, Lab: Disease models • Read: Leopold (Ch 9)
Section VIII Week 13 (Nov 10 – 14)	• **Lecture M**: Wildlife Harvest • **Lecture W**: Population cycles • **Lab F**: Population cycles (Paper discussion: Krebs et al. 1996) • **Assignment 1**-*Thursday*, Quiz on Krebs et al. 1996 • Read: Kendall et al. 1999
Section IX Week 14 (Nov 17 – Nov 21)	• **Lecture M**: Paper presentations • **Lecture W**: Paper presentations • **LAB F**: Paper presentations • **Assignment 2**-*All days*, Quiz papers • **Assignment 3**-Paper presentations • Read: Papers
Week 15 (Nov 24 – 28)	• **Lecture M**: Online lecture
Week 16 (Dec 1 – 3)	• **Lecture M**: Guest Lecture (TBD) • **Lecture W**: Class review

7. **Educational Strategies**: We follow an active learning framework that include inquire-based lectures, analysis of the primary literature, computer exercises, group projects and group discussions

8. **Minimum resources available**: Lecture room, Computer lab, audio-visual equipment.

9. **Evaluation strategies**:

Quizzes	10%
Lab prep	30%
Group exercises	20%
Exams	40%

Every week there will be a quiz (formative assessment) due on Fridays before 11pm. Labs will have two evaluations: a *prep* and a *group project*. A prep consists of an `R` worksheet or a paper designed to give you the necessary skills to conduct the group project in the lab.

Each prep will have a quiz that is due Thursdays before 11pm. Group project reports are due on the Monday following the lab before noon.

Exam 1 is scheduled for Oct 1
Exam 2 is scheduled for Nov 5
Final exam is schedule for Dec 11

10. **Grading**:

>= 93.00 %	A	90.00–92.99	A-
87.00–89.99	B+	83.00–86.99	B
80.00–82.99	B-	77.00–79.99	C+
73.00–76.99	C	70.00–72.99	C-
67.00–69.99	D+	63.00–66.99	D
60.00–62.99	D-	< 59.99	E

Information on current UF grading policies is available at https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx. CANVAS grading is a useful guide that could differ from the final grade.

11. **Textbook**: There are no book requirements for this course. However, Gotelli's "A primer of Ecology" is highly recommended for students that want to complement lecture materials. A course packet will be available electronically via CANVAS that contains required weekly readings, lecture, and lab information.

    You can find complementary content on these sources:

    Gotelli, N. J. (2001). A primer of ecology. Sunderland, MA: Sinauer Associates.

    Hanski, I. (1999). Metapopulation ecology. Oxford University Press.

    Kendall, B. E., Briggs, C. J., Murdoch, W. W., Turchin, P., Ellner, S. P., McCauley, E., ... & Wood, S. N. (1999). Why do populations cycle? A synthesis of statistical and mechanistic modeling approaches. Ecology, 80(6), 1789-1805.

    Kingsland, S. E., & Kingsland, S. E. (1995). Modeling nature. University of Chicago Press.

    Leopold, B. (2019). Theory of Wildlife Population Ecology. Waveland Press.

    Rockwood, L. L. (2015). Introduction to population ecology. John Wiley & Sons.

12. **Class attendance and demeanor policy**: Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/.

13. **Rights of students with Disabilities**: The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student

disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.
0001 Reid Hall, 352-392-8565, https://disability.ufl.edu/

14. **Student evaluations**: Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

15. **Academic honesty**: As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

16. **Campus helping resources**: Campus Helping Resources Students experiencing crises or personal problems that interfere with their general well- being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

    - University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu Counseling Services Groups and Workshops Outreach and Consultation Self-Help Library Wellness Coaching
    - U Matter We Care, www.umatter.ufl.edu/
    - Career Connections Center, First Floor JWRU, 392-1601, https://career.ufl.edu/.
    - Student Success Initiative, http://studentsuccess.ufl.edu.

    Student Complaints:

    - Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.

- Online Course:
  https://pfs.tnt.aa.ufl.edu/state-authorization-status/#student-complaint
  Additional information Instructors may choose to clarify in their syllabus their teaching philosophy, expectations for classroom behavior, utilization of e-learning, and other information that will help students succeed in the course.

17. **Software use**: All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

18. **Online Course Evaluation** Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at: https://gatorevals.aa.ufl.edu/public-results/.

19. **Academic policies and resources** Please, see more at UF - Office of the Provost