

**WATER/WILDLIFE 353/553**  
**WILDLIFE AND FISH POPULATION DYNAMICS**  
**FALL SEMESTER 2007, 3 CREDITS**

- Instructors:* Michael J. Hansen Tim F. Ginnett  
*Office:* 174 CNR 342 CNR  
*Office Hours:* Posted Posted  
*Office Phone:* 715/346-3420 715/346-4191
- Classroom:* 120 CNR
- Lectures:* Monday, Wednesday, and Friday 12:00–12:50
- Objectives:* The course will introduce students to principles of population ecology and how such principles relate to basic models of wildlife and fish population dynamics.
- Texts:* Charles J. Krebs. 1998. Ecological Methodology. Addison-Wesley. [D2L and Electronic Reserves]  
Michael King. 1995. Fisheries Biology, Assessment, and Management. Blackwell Science. [D2L and Electronic Reserves]  
Larry L. Rockwood. 2006. Introduction to Population Ecology. Blackwell. [Purchase]
- Exams:* Three 100-point in-class exams will be given during the semester, each of which must be taken at the scheduled time or a score of zero will be assigned. Illness or a family emergency may be cause for re-scheduling an exam, but only if you notify one of the instructors prior to the exam period. Email and voice-mail have date and time stamps that allow you to notify us of an absence even when we are away from the office. The first exam will cover population estimation, exponential population growth, logistic population growth, and recruitment. The second exam will cover mortality, age-structured population growth, individual growth, and population dynamics (yield) models. The third exam will cover metapopulation dynamics, population viability analysis, competition, predation, and harvest management.
- Homework:* Three 25-point homework assignments will be given during the semester, each of which relates to the same three segments of the course that are covered by the exams. The homework assignments will require you to solve mathematical or statistical problems that are not amenable to coverage during in-class exams.
- Attendance:* Roll will not be taken, but students who repeatedly miss class should consider enrolling in a correspondence course. Understanding and assimilation of class material, and performance on exams, is enhanced by regular class attendance. Similarly, the quality of your educational experience in this course will be directly related to the amount of time you invest in classroom preparation and the extent to which you become involved in classroom discussions.
- Grading:* Final grades for the course will be awarded as follows: A = 93%; A- = 90%; B+ = 85%; B = 80%; B- = 75%; C+ = 70%; C = 65%; C- = 60%; D+ = 55%; D = 50%; F = <50%. The final class grade will be based on the percentage of total

points earned, out of 375 total points possible (3 exams  $\times$  100 points/exam + 3 homework  $\times$  25 points/homework).

*Schedule:* The tentative schedule below identifies subjects to be covered in the three weekly lectures (each lecture topic is shown in italics), followed by the reading that is appropriate for that topic. The schedule is intended to forecast the sequence of topics and lectures, but the instructors reserve the right to modify the sequence and timing of the lectures to accommodate needs of the class.

*Date:* \_\_\_\_\_ *Lecture Topic:* \_\_\_\_\_ *Textbook Reading:* \_\_\_\_\_

*Introduction:*

Sep 5 Course Introduction (*TFG*)  
 Sep 7 Statistical Tools (*TFG*) *Krebs – Chapter 1*  
 Sep 9 Mathematical Tools (*MJH*)

*Population Estimation (MJH):* *Krebs – Chapters 2-5*

Sep 12 Closed Population Mark-Recapture Models  
 Sep 14 Closed Population Mark-Recapture Models cont.  
 Sep 17 Open Population Mark-Recapture Models  
 Sep 19 Change-in-Ratio, Depletion, Area-Density, and Line-Transect Models

*Exponential Population Growth (TFG):* *Rockwood – Chapter 1*

Sep 21 Discrete versus Continuous Time Models  
 Sep 24 Rates of Increase, Doubling Time and other topics  
 Sep 26 Demographic and Environmental Stochasticity

*Logistic Population Growth (TFG):* *Rockwood – Chapter 2*

Sep 28 Density Dependence: The Logistic Equation  
 Oct 1 Variations on the Logistic Equation

*Recruitment (MJH):* *King – Section 3.5*

Oct 3 Conceptual Framework  
 Oct 5 Data Limitations  
**Oct 8 Review for First Exam**  
**Oct 10 First Exam (evening exam @ 5:00 – 7:00 PM)**

*Mortality (MJH):* *King – Section 3.6*

Oct 12 Catchability and Selectivity  
 Oct 15 Instantaneous, Annual, and Conditional Mortality  
 Oct 17 Parameter Estimation

*Age-Structured Population Growth (TFG):* *Rockwood – Chapters 3 & 4*

Oct 19 Survival and Fecundity  
 Oct 22 Life Tables  
 Oct 24 The Leslie Matrix  
 Oct 26 Reproductive Value and Stage Structure

*Individual Growth (MJH):* *King – Sections 3.2 & 3.4*

Oct 29 Weight-Length Relationships  
 Oct 31 Maturity, Fecundity, and Incremental Growth Models

Nov 2 Continuous Growth Models

*Yield (MJH):*

*King – Chapter 4*

Nov 5 Surplus Production Models

Nov 7 Yield-per-Recruit Models

Nov 9 Cohort Analysis

**Nov 12 Review for Second Exam**

**Nov 14 Second Exam (evening exam @ 5:00 – 7:00 PM)**

*Metapopulations & Population Viability (TFG):*

*Rockwood – Chapter 5*

Nov 16 Extinction

Nov 19 Introduction to Metapopulations

Nov 21 Variations on Metapopulation Models

**Nov 23 Thanksgiving Break – no class**

Nov 26 Population Viability Analysis

*Species Interactions (TFG):*

*Rockwood – Chapters 7 & 10*

Nov 28 Species Interactions: Modeling Competition

Nov 30 Competition Continued

Dec 3 Predation - Functional and Numerical Responses

Dec 5 Predation - Models and Theory

*Harvest Management (MJH & TFG):*

*King – Chapter 6*

Dec 7 Principles and Practices (MJH)

Dec 10 Case Study – Fish Management (MJH)

Dec 12 Case Study – Big Game Management (TFG)

**Dec 14 Review for Third Exam**

**Dec 17 Third Exam (10:15 – 12:15)**

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